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# **ILLUSTRATIONS**

OF THE

# SALTS OF THE URINE, URINARY DEPOSITS AND CALCULI,

INCLUDING

THE STRUCTURE OF THE KIDNEY IN HEALTH AND DISEASE; MICROSCOPICAL AND CHEMICAL APPARATUS, ENTOZOA, &c.

## SEVENTY PLATES,

CONTAINING UPWARDS OF 400 SEPARATE FIGURES, CAREFULLY COPIED FROM
THE OBJECTS THEMSELVES.

BT

# LIONEL S. BEALE, M.B., F.R.S.,

FELLOW OF THE ROTAL COLLEGE OF PHYSICIANS; PHYSICIAN TO KING'S COLLEGE HOSFITAL; PROFESSOR OF PHYSIOLOGY AND OF GENERAL AND MORSID ANATOMY IN, AND RONORARY PELLOW 97, RING'S COLLEGE, LOJDON.

SECOND EDITION,

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# PREFACE.

THE number of Plates has been increased from thirty-five to seventy, and there are two hundred and forty-five more figures than in the first edition. Many of the old drawings have been re-engraved, and nearly one hundred new ones have been introduced.

It is hoped that by the aid of the Work in its present form, the Practitioner will be enabled to ascertain the nature of any urinary deposit which may fall under his notice, without difficulty or loss of time.

L. S B.

61, GROSVENOR STREET,

October, 1868.

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Plate XXIII. Fig. 125. Pus corpuscles exhibiting very active move-From the bladder of a case of chronic inflammation, showing alteration in form due to vital (?) movements. Fig. 126. Pus corpuscles from urine. Fig. 127. Pus corpuscles which have been acted upon by acetic acid. Fig. 128. Pus corpuscles under the action of acetic acid: a, action commencing; b, complete. Fig. 129. Pus corpuscles showing protuberances. Fig. 130. Formation of pus from germinal matter of epithelium. Fig. 131. Growth and multiplication of pus corpuscles. Fig. 132. Multiplication of pus corpuscles, p. 364.

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late XXXIII. Fig. 181. Modified form of triple phosphate or phosphate of lime and triple phosphate. Fig. 181\*. Octahedra and dumb-bells of oxalate of lime and curious forms of fungi found in the urine of a young man passing much oxalate of lime. Fig. 182. Collections of dumb-bells firmly adherent to each other. Fig. 183. Minute crystals of oxalate of lime with sporules of fungi resembling blood corpuscles. Fig. 184. Dumb-bells subjected to the prolonged action of acetic acid showing the crystalline material nearly dissolved away. Fig. 185. Perfect dumb-bell crystals from the urine of a child suffering from jaundice. Fig. 186. Dumb-bell crystals of oxalate of lime aggregated together, forming a minute calculus. Fig. 187. Spherical, oval, and dumb-bell crystals, p. 384.

late XXXIV. Fig. 188. Crystals of cystine from the urine of an insane patient. Fig. 189. Crystals of cystine. Fig. 190. Clusters of crystals of cystine formed by evaporating a solution of the crystals represented in fig. 188 in ammonia. Fig. 191. Very small six-sided crystals of cystine formed by gently evaporating a solution of the crystals represented in fig. 188 in ammonia. Fig. 192.

Irregularly formed crystals of cystine. Fig. 193. Crystals of carbonate of lime seen by reflected light. Fig. 194. Blood corpuscles: a, b, c, taken from the living body; d, e, f, from the urine; d, corpuscles smaller than natural; at e their circumference is serrated and ragged, and also at f. Fig. 195. Large cells filled with granular matter in the urine of a case of chronic bronchitis. Fig. 196. Crystals of carbonate of lime in Canada balsam, appearance with transmitted light. Fig. 197. Tubercle corpuscles from a tubercle in the lung. Fig. 198. Cells found in the urine of a case of renal dropsy. Fig. 199. Cells found in the urine of a child, age 14, suffering from hæmorrhage. Fatty degeneration, 7 months. Fig. 200. Altered blood, menstrual fluid, p. 383.

Plate XXXV. Fig. 201. Rhomboidal and feathery crystals of hæmatoidin, from a softened clot. Human. Fig. 202. Feathery crystals of hæmatoidin found in the urine a fortnight after slight rupture (?) of one kidney. Human subject. Fig. 203. Cancer cells from the urine in a very bad case of cancer of the uterus. Fig. 204. Cancer cells from a case of cancer of the bladder. Found in the urine. Fig. 205. Cells from the urine of a case of acute rheumatism: a, in the natural state; b, treated with acetic acid; c, resembling pus; d, the same treated with acetic acid. The small circular bodies are blood corpuscles. Fig. 206. Blood in the form of irregularly shaped clots from the vagina, p. 394.

#### ENTOZOA.

Plate I. Fig. 1. Layers of which the wall of an hydatid cyst is composed. Fig. 2. Echinococci from hydatid liver of ox. Fig. 3. Echinococci. Fig. 4. Free hooklets of echinococci. Fig. 5. Hooklet of echinococcus. Fig. 6. Tenia echinococcus. Fig. 7. Diptoloma crenata half the real size. Fig. 8. Ova of bilharzia hæmatobia found in urinary deposit. Fig. 9. An ovum of bilharzia hæmatobia highly magnified. Fig. 10. Ova of bilharzia hæmatobia. Fig. 11. Bilharzia hæmatobia, after Bilharz, p. 402.

#### URINARY CALCULI.

Plate I. Fig. 1. Large uric acid calculus consisting of concentric layers of uric acid deposited upon a smaller calculus composed of oxalate of lime. Fig. 2. Beautiful example of oxalate of lime calculus, the surface of which is of a pale brown colour, and the tubercles small and delicate. Fig. 3. Mulberry calculus which was of a rich plum colour. Fig. 4. Small prostatic calculi. Fig. 5. Large mulberry calculus two-thirds the real size. Fig. 6. Phosphatic calculus. Fig. 7. Blood calculus from the infundibula of the kidney. Fig. 8. One large and two small blood calculi from the pelvis of the kidney. Fig. 9. Phosphatic calculus, the nucleus composed of a small uric acid calculus. Fig. 10. Small calculi from the kidney. The nuclei composed of soft granular material, probably disintegrated epithelium. Fig. 11. Very small calculi from the follicles of the prostate gland, p. 416.

Plate II. Fig. 12. Small compound oxalate of lime calculus found in the urine of a young man who was passing numerous dumb-bells of

oxalate of lime and crystals of uric acid. Fig. 13. Compound oxalate of lime calculus from the same case as that shown in fig. 12. Fig. 14. Urinary deposit consisting of crystals of triple phosphate, and smooth and irregularly shaped oxalate of lime calculi passed in immense numbers from a gentleman suffering from symptoms of renal calculus. Fig. 15. The same calculi as shown in fig. 14 after being treated with acetic acid. The nuclei and concentric layers of each individual calculus have been rendered beautifully distinct, p. 429.

Plate III. Fig. 1. A calculus which had undergone spontaneous fracture in the bladder. Figs. 2 and 3. Portion of a calculus which had separated before removal. Fig. 4. Another calculus which had

undergone spontaneous fracture, p. 434.

#### Fig. 1.



Diagram showing the general anatomy of the human kidney as seen upon section. About two-thirds the natural size. The scale at the side is divid-id into eight spaces representing half-inches p. 2.

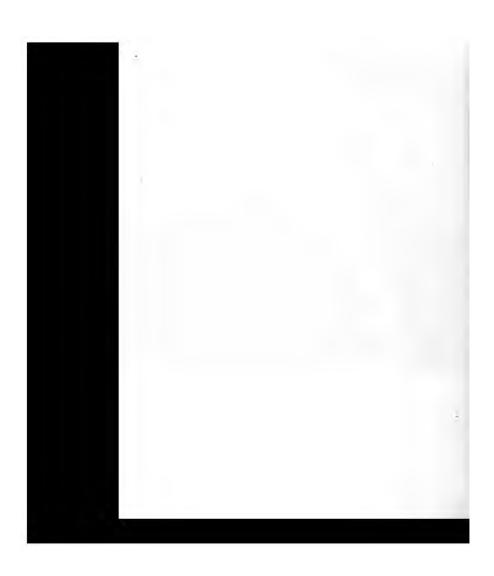


Thin section of a portion of the human kidney a, cortical; b, medullary portion; c, peivis; d, iniundibulum; e cpening of an infundibulum into pelvis; f, calyx; p, pyramid; b, mamilla or papilla; i adipose tissue; k large veins divided in making the section. Small arteries are also seen cut across in different parts of the section, some large branches being situated between the cortex and the medullary portion of the ordan. p, 3.

#### Fig. 3,



The secreting portion of the human kidney, showing the urinterous tube, k, commencing in a flask like dilatation, a, i, which embraces the capillary vessels of the Malpishian tuft. a, a branch of the artery, afferent vessel, which enters the Malpishian tuft. c the vein or efferent vessel. x about 60. y y y.



## STRUCTURE OF THE KIDNEY.

#### PLATE II.

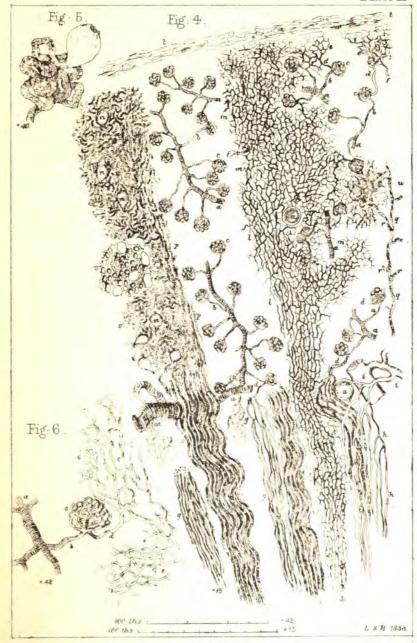
Fig. 4. Part of the cortex, with the commencement of the medullary portion of the kidney, magnified 15 diameters. a. Branches of artery. b. Afferent vessels of tuft. c. Malpighian tufts. d. Efferent vessel of tufts. e. Network of capillaries, into which the blood, after having traversed the capillary loops of the tuft, is carried. f. Small radicles of renal vein, by which the blood is returned to the large trunks. g. Long and almost straight vessels (vasa recta), into which the efferent vessel of those tufts situated at the bases of the pyramids, divides. These straight vessels may be traced for some distance towards the apex of the cone, h. Veins in the same situation, which return the blood to the large venous trunk, i. k. Capillary network in the pyramids. 1. Portion of the capillary network of the cortex, where the meshes are elongated, corresponding to the direct course which many of the uriniferous tubes take, at regular intervals, in the cortex. m. Network of other parts of the cortex, in which this arrangement is not observed, n. Malpighian bodies not injected. o. Convoluted portion of uriniferous tube. p. Tubes having a direct course towards the cones, situated at regular intervals through the cortex. At / would be situated another parcel, and at q a third. The arteries pass in the intervals between these, as represented. q. One of the tubes isolated. I have never been able to demonstrate the branches represented, in the human subject, but from their existence in some of the lower animals, it is probable that a similar arrangement may be found in the higher. The branches r must therefore be considered merely diagrammatic. r. Branches continuous with the convoluted portion. s. Wavy portion of uriniferous tube, at the commencement of the cones. t. Capsule of u. Uriniferous tube, with Malpighian tuft and capillary vessels complete. v. Capillary network, with fragments of uriniferous tubes, from which the epithelium has been washed out (the so-called matrix of the kidney).

Fig. 5. Uriniferous tube, with dilated extremity, which embraces the vessels of the Malpighian tuft. The epithelium is seen in the convoluted portion of the tube, but cannot be traced within the capsule in the

human subject.

Fig. 6. Small artery, with tuft and capillary network, accurately copied from a specimen. The artery is seen to divide into three or four branches, and each of these gives off capillary loops, which divide and subdivide for some distance before they communicate with those of another division. The letters refer to the same parts as indicated in fig. 1. Every part of fig. 1, with the exception of q, r, has been copied from actual specimens, prepared from a number of kidneys. The separate drawings thus obtained have been grouped in their proper position, in order to complete the drawing. Fig. 5 is partly copied from nature. Fig. 6 is entirely traced from a preparation. The injection employed for making the specimens was the Prussian blue fluid.\*

<sup>\* &</sup>quot;How to work with the Microscope."





### STRUCTURE OF THE KIDNEY.

#### PLATE III.

EPITHELIUM OF URINIFEROUS TUBE, PELVIS OF THE KIDNEY, URETER, AND URETHRA.

Fig. 7. Convoluted portion of uriniferous tube with epithelium, from the cortical portion of the kidney. a. Basement membrane. b. Epithelium. c. Part of tube from which the epithelium has been squeezed out, leaving only the basement membrane. d. Capillary vessels containing transparent injection, showing their relation to the wall of the tube. c. Separate cells of epithelium magnified 403 diameters.

Fig. 8. Straight portion of uriniferous tube from the base of a pyramid. a. Basement membrane. b. Epithelium. c. A tube from which the epithelium has been removed. d. One of the large straight vessels found among the tubes in the pyramids. e. Capillaries also present in this part of the kidney. f. Separate epithelial cells magnified 403 diameters.

Fig. 9. Epithelium from the pelvis of the kidney, in part tessellated (a) and in part columnar.

Fig. 10. Epithelium scraped from the surface of a pyramid.

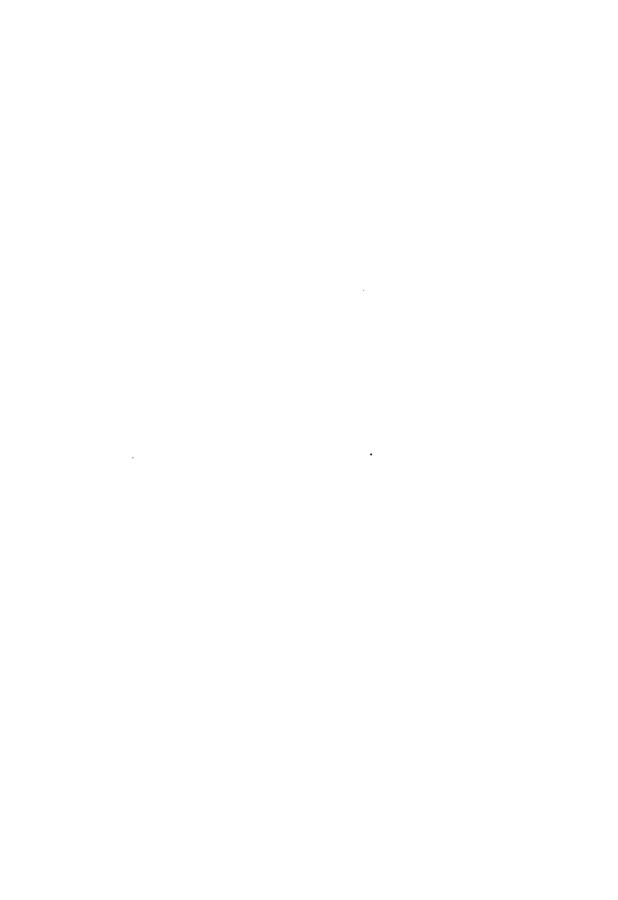
Fig. 11. Epithelium from the ureter, entirely columnar.

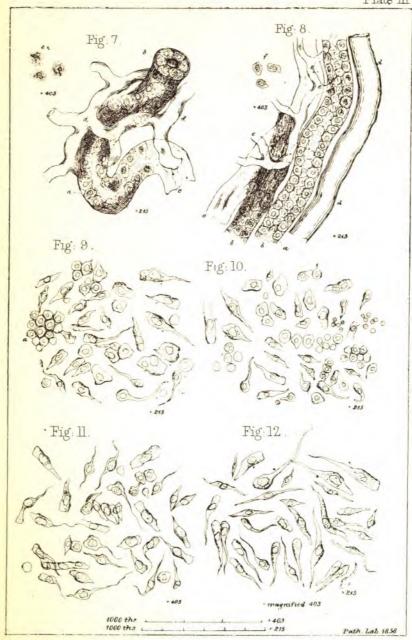
Fig. 12. Columnar epithelium from the urethra.

The specimens from which all these drawings were copied, were taken from the organs removed from the body of a man, aged 40, who died of pneumonia, otherwise healthy.

The vessels of part of the kidney were injected with Prussian blue fluid,\* in order that the relation of the capillaries to the uriniferous tubes might be distinctly made out. The character of the epithelium lining the convoluted portion of the uriniferous tube is represented at e (fig. 7). Generally, the cell does not exhibit a distinct outline as is usually represented, although, on the contrary, the outline of the nucleus is often sharp and well defined. The material around the nucleus usually appears granular, and I am not satisfied as to the existence of a distinct cell-membrane. The nuclei are very large, and may easily be mistaken for the entire cell. The epithelium in the straight part of the uriniferous tube in the medullary portion of the kidney is flatter, and its outline is more distinct. In the cortex, the epithelium takes part in secretion, but in the medullary portion of the organ it probably corresponds to the epithelium of the ducts of glands generally. Many vessels in this part of the kidney pursue a very straight course, and are of large size, their diameter being equal to, or even greater than, that of the tubes, d (fig. 8).

<sup>\*</sup> For the composition of this fluid, see "How to work with the Microscope."







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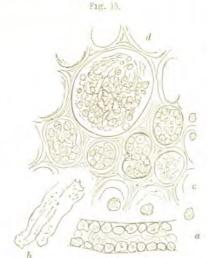
# STRUCTURE OF THE KIDNEY.



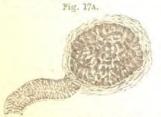
2 403 Vasa recta in the pyramidal portion, and Mal-pielium bodies in the cortical portion. At about the point of union between portical and straight portions of kidney. p. 7 m Malpighian burt of human nuclei connected with their separated from the rest of the somewhat commenced, showing ened c, these which connects FIE. 15A

Fig. 16. Fig. 17.





arouted portion of urbitration tube, are supposed in us spitchnum, c, out-crimated applicates, having a fibrour as a safet motion. d, very small had one of vessels shrinks showing relis is walls. X file. pp. 18. 20.



Toung and growing Malpishian body of a child, age 25 years. The muscular fibre cells are seen on the small artery quite close in the Malpishian body. × 215.



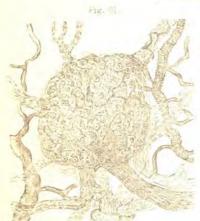
Epithelium from the ureter, p. 14. x 215.

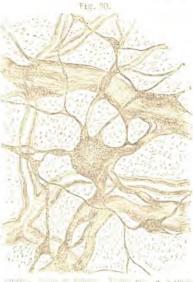


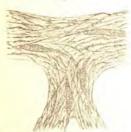
alpiglian body and tube of the newt's kidney x 130, pp 16, 19

Figr. 19A.

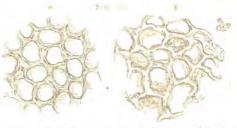
A part of the convenient govern of a numberous time from the newl's kidney abovers gaphary cases and reconstruction and the blocketed basement trembrane community and entering with the convenient result.







Delicate norse fibres entering into the formation of the bundles connected with the ganglia of the kidney, showing their arrangement and their nuclei.

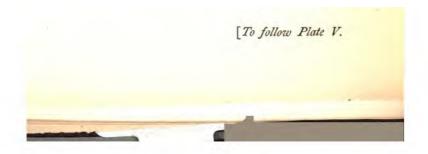


a, section of certaral period of healthy kidney (human). Washed in water and essayined in the same medium. The capolaries were not injected, and heaving collapses and streams subject to the throug appearance which is sometimed to depend upon the nature. The nucleon of another part in which the wasels were thorough The nucleon of another part in which the wasels were thorough The nucleon of another part at which the wasels were thorough The nucleon.

#### STRUCTURE OF THE KIDNEY.

#### PLATE VI.

- Fig. 24. Section of the cortical portion of a human kidney, the vessels of which have been injected with the Prussian blue solution. a. Membrane of the tubes. The a to the right of the figure shows the position of a Malpighian body: b a portion of a capillary loop of a Malpighian body: c venous capillaries lying between the uriniferous tubes. In many places the double shaded line indicates the basement membrane of the tubes: d position of the uriniferous tubes.
  - Fig. 25. Transverse section at the base of a pyramid.
- Fig. 26. A similar section a short distance lower down, showing sections of the uriniferous tubes. The small tubes join the larger ones at a point lower than that at which the section is made.
  - Fig. 27. Section nearer the apex of the pyramid.
- Fig. 28. Apex of a pyramid showing the manner in which the uriniterous tubes open into the pelvis of the kidney.



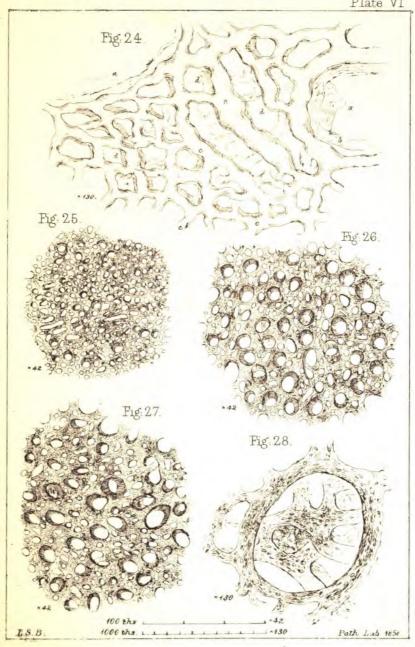
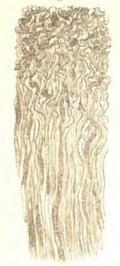




Fig. 29.



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Fig. 30.



Trinsverse s-ction of the tolors of the half-y of a space occupied by large crystals of one most state of the

Fig. 31.



Crystals of leucine in the substance of sidney. Human

Fig. 32:

trisaris of some more freshing transfer trues (no bing specifical action p. 12

Fig. 33.



A small purpose of the small (anglier represented in Fig. vi. Plate V., but magnified 500 diameters showing gaughen refls and their connection with the neive fibres p. 15.

hig. 34.

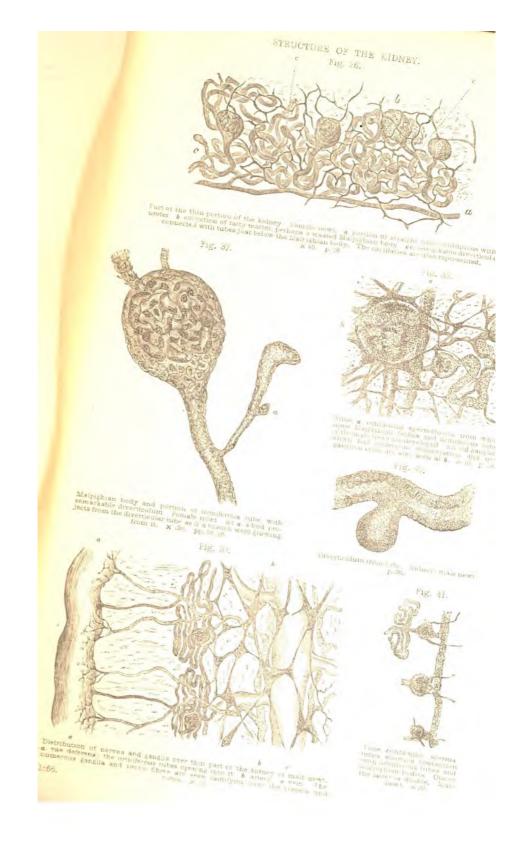


(these of intrinsic kniftery. With earthy chosphates proof) cased officingst the cells:  $\propto$  -15. p. 12.

Fig. 35.



a portion of brighterous tube;
b, cap hare ressel; and c, nerve
filters, faidney, chila age if
X 700 p. 41.

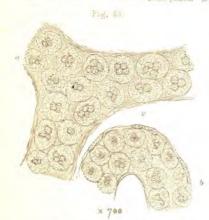


# STRUCTURE OF THE KIDNEY,

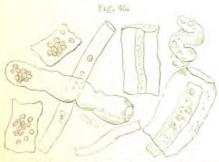
Fig. 40.



Tube of kidney or lemmis mater, part of which has undergone deconstration and wastine. The healthy portion of the tube is some places. x = x + y = 3. Grave flores are also seen in some places. x = x + y = 3.



a portion of a capillary vessel of the kadner, distending will alread white blood our means. A. Farial distanced cells from times surface of carsain of the Mahagana body c. nucleus of capillary wall. Acute supportants amplicates p. 48.



Casts containing cells like pus and blood corpuscles. Acuto supportative nephritis. Three mays before neath, p. 40.



through of a can incomined 760 diameters with calls in the central part resolution. White block of pair section is conjugate, which have probably another with they were enturated in the against material or the



Small costs formed in the convoluted portion of the provinceme times, which have become orbidded in thosparent marginal during these passage from the straight portion.

Kill, p 59.



# DISEASES OF THE KIDNEY Fig. 45.



tion of a cast with distinct a showing nuclei and gra-lateoniesis. Acute imphriti-x 700

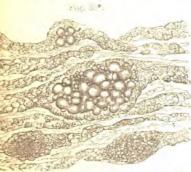






and wasted. A 21b. p. d.





b-bell crystals of oxcials of line impacted to the s of a kidney, forming minute calcium × 250, p. (2)



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Atom a graphed of a chaper.





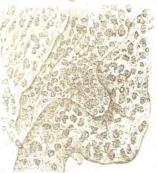
A portion of one of the capitlary loops of a Malpighian body, distended with modified white blood corpuscles. × 700.

Fig. 50.



Separate cells found in the urine Case of source supportative repliritis. x 700,

Fig. 53.



Multiplication of masses of germinal matter about tubes prior to washing. × 210. p. 63.

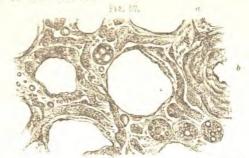
Fig. to.







wasting tube, with oil globules in the interior.
 tube contaming transparent wary cast, with extrained under resultant from altered egithelium. Fatty and contracting kidney. X 216.



A thin section of the cortex of a fatty and contracting Ridney, showing the remains of tubes and vessels in this is generally considered as the matrix of the remains of a far a popular a counterfee tissue corousels, b small arm y with thickened Walls x 215, pp. 70 68

Fig. 58.



rig. ta.

Trithellow of tube much altered. Walls of ture touch thickened. x 000. Party and contracting killing. p 65

Section of certex of fatty and contracting kidney, x 1%, p.61

m - 61



Capillaries, Malpishian hody, Patty and couracting kidney. Bacteria are seen in the luterior of the vessel, the walls of which are very much thickened × 700.



Loops of yeasels of the Malpishian toft, distended with granular matter, and containing oil stobules  $\times$  15  $\,$  p. 65.

Fig. 63.



Fortion of altered tabe, with a bud growing from it. Fatty and conbracting kidney. x 500. p 56.

# Fig. 62.



Portion of very transparent matrix, showing the remains of uninterous tubes Fatty and contracting kidney × 700 p.06.



Section of uniniferous tubes in various stages of wasting and decemenation. Fatty and contracting kidney. In some of the tubes there is much oil. × 215.



ritter as but a section of the ar-med with a drawn of estimated about no employ the factor at a p.1.

Fig. a..

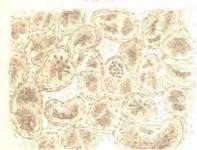
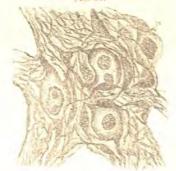






Fig. 33.





programed amongs the relative the p. 10.

Fig. 35,



n position of weatherness time, b, capitally seed, and c helve times. Kniholy, chain age of N 100 pt 21.

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A part of the convoluted portion of a numberode this from the newt's studies allowing our live assets and members, and the thickened basement needleane continuous in structure with the anticolier leave X VIA on 16 fee.

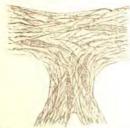




alpiglian body and tube of the newt's kidney x 130, pp.18, 19

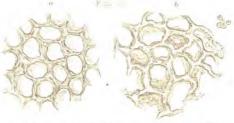


a. a small



F. d. .

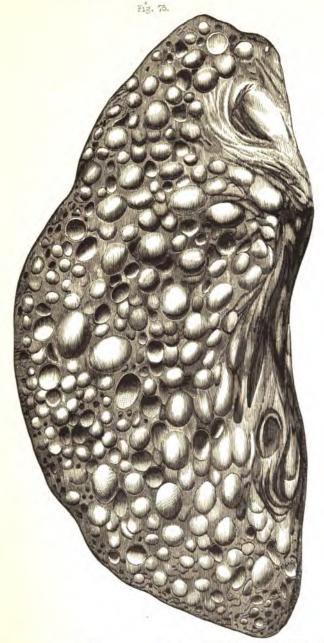
Delicate nerve fibres selecting into the formation of the bundless counseded with the ganglin of the kidney, showing their arrangement and them nuclei.



a section of cortical portion of health, kidney (human). Washed in water and examined in the same medium. The capularies were not injected, and having collapsed and shrunk exhibit the fibrous appearance which is considered in depending on the manual, a section of another part in which the vessels were therefore the track on the manual and seem of the manual and seems of the seems

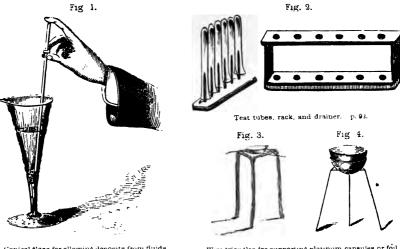


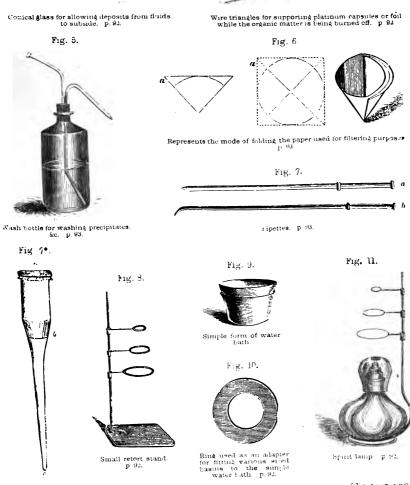
# DISEASES OF THE KIDNEY.



Full size representation of section of the right kidney, showing the enormous developmen tysts throughout its substance. The presence of these growths is evidently due to intra-ute disease of the fectus. From a drawing by Dr. J. Junding Murray. p 79

#### CHEMICAL AND MICROSCOPICAL APPARATUS.





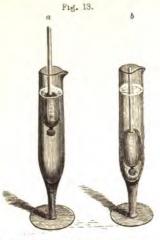
Pipette forming [To face yage stopper p 99.



#### CHEMICAL AND MICROSCOPICAL APPARATUS.



Retort stand, funnel, and beaker, arranged for filtering. p 94.



Glasses of convenient form, both for obtaining the specific gravity of fluids and also for collecting the deposits from fluids p. 92.



Bottle, with capillary orifice. p. 97.



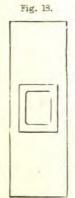
Uninometers for ascertaining the specific gravity of fluids p. 93.



Bottle for finding the specific gravity of fluids by weight p 93



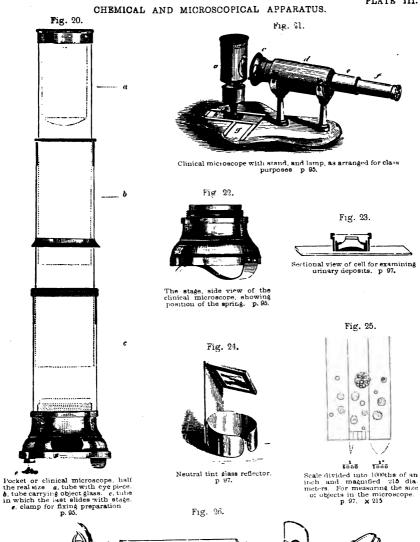
Animalcule case, also used for examining urmary deposits, &c, under the microscope, p 97.

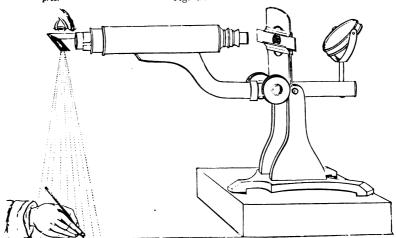


Simple glass cell for examining of urmary deposits. p. 97.



Box containing bottles with capillary orifices, spirit lamp, unnometer and glass, and other appliances and apparatus necessary for minute testing. p. 97.



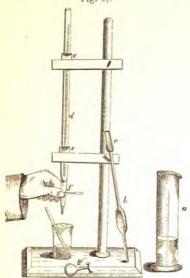


Manner of drawing objects from the microscope with the aid of the neutral tint class reflector.  $p, \psi_0^*$ 



Figs. 30, 31.





Furette, holding for cubic centimetres, and graduated to half c.c., m unted in its stand and arranged as in making analyses. a, glass jar capable of holding 500 c.c. b. pipette graduated to hold 30 c.c. c, india-rubber tube by which the contents of the pipette are caused to flow as required. A is the burette. c, small pieces of india-rubber for fixing the burette in its place. f; india-rubber tube connecting the extremity of the burette with the spout, and capable of being compressed by the spring, the form of which is represented at g. p. 102.

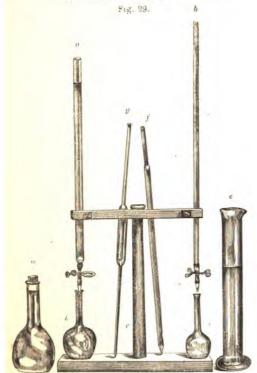
Fig. 28.

Filter useful in volumetric analyses for obtaining a small quantity of clear solution in order to see fall the substance is precipitated Filtering paper is ted round the lower extremity, a. b is the spout through which the clear filtrate is poured. p. 102.

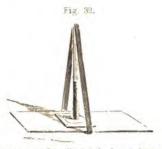


Pipettes of different forms graduated p. 102

Commission of the Commission o

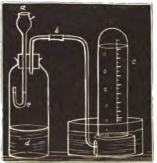


Double burstle stand fitted with burstles scannated to dem a .10-dem, burstle. b, 30-dem, burstle. c, double burstle stand. d, a 100-dem, flask atoppered. e, a 100-dem, cyluder f, a 50-dem, while pipette. g, a 10-dem, graduated pipette. A, a 00-dem, flask i, a 200-dem, flask. According to Mr. Sutton's directions. p. 10-



Arrangement for collecting the deposit from a very small quantity of fluid. p. 284.

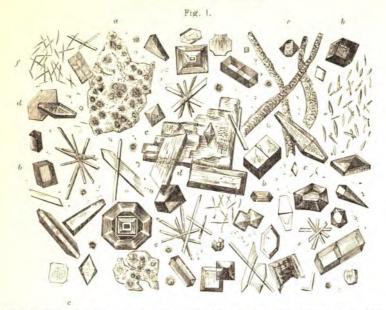
Fig. 33.



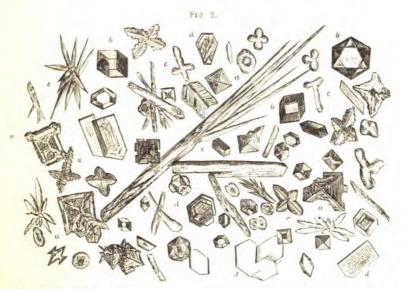
apparatus as arranged by Dr. Handfield Jone for estimating the proportion of urea in urine.
p. )14.



#### ILLUSTRATIONS OF URINE.



Crystalline residue of healthy urine, obtained by concentrating the liquid over a water bath a spherical masses consisting of aggregations of crystals of urate of soda. Many of these are seen deposited upon a film consisting of phosphate of time and aumoniaco magnesian phosphate. b. cubical crystals of chloride of sodium e. octahedral crystals of chloride of sodium, which crystallizes in this form in the presence of urea. d. large crystals of common phosphate of sodia. e. sulphates. f. urates. × 40. p. 131.



Crystals of inorganic salts of healthy urine, obtained by incinerating the dry residue, decarbonrying it, and extracting it with water. The solution being concentrated to the proper degree, readily crystallizes. a, crystals of common salt, obtained by evaporating the solution nearly to dryness. b, crystals of common salt formed in a concentrated solution. e, crossists of common salt obtained by evaporating the solution very rapidly to dryness. d, crystals of phosphate of soda. e, crystals of sulphates. p, 156. x 130.



#### ILLUSTRATIONS OF URINE



Chloride of ammonium. × 915. p. 130.



Orystals of unc soid. x 215, p. 139



| xalate of urea, obtained by adding oxalic acid to concentrated urine × 215. p. 132.



rystals of indigo a and b obtained by sublimation e, small orpotals in fluid. p. 188.



Nutrate of mea.  $\alpha$  orystals obtained more unine: b crystals of pure unitate of mea.  $\times$  215 p. 101





Crystals of uroglaucine from the urine, a, small masses of a blue colour, b, composed of small spherical particles of uroglaucine of a deep purple or violet coloni x 103, p. 145.



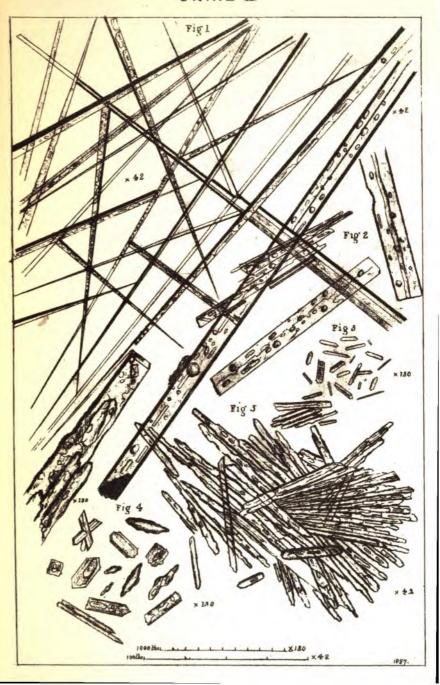
West obtained from 1922 x 215 p lim.



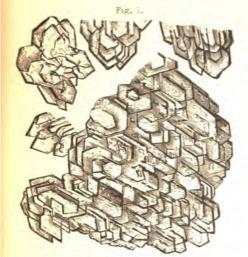
Fig. 0.



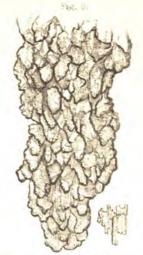
# URINE-II



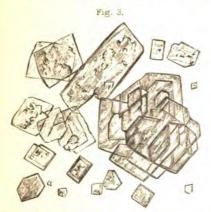




Viyetals of nitrate of urea (C<sub>2</sub>H<sub>4</sub>N<sub>2</sub>O<sub>2</sub>, HC, NO<sub>2</sub>) formed adding excess of nitro acid to concentrated urine × 130. p. 134.



Nitrate of used formed by adding a parameter of inting and not sufficient to with the whole of the used present X 130, r 131.

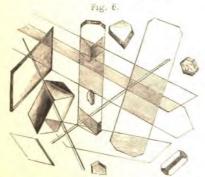


Nitrate of urea, obtained by adding a moderate [panish] nitric acid to slightly concentrated urine in a test tule study allowing it to crystallize slowly. x 130.



Pig. +

Nitrate of tirea obtained by adding a marked syress of nitric and | x los



Crystals of pure nitrate of urea, obtained by disserving some of the nitrate in water and evaporating, so that crystals may form. × 130



Sitrate of one housed by whirity only two drops of nutric acts to highly concentrated using. x 1.00

(To man Thee 334



#### ILLUSTRATIONS OF URINE.

### PLATE IV.

# Oxalate of Urea, C2H4N2O2, HO, C2O3.

- Fig. 1. Crystals of oxalate of urea, obtained by re-crystallizing nearly pure oxalate of urea from an aqueous solution. a. Dendritic masses, in which the form of the crystal is not very distinct. b. Masses of well formed crystals. c. Perfect crystals of oxalate of urea.
- Fig. 2. Crystals of oxalate of urea obtained by evaporating healthy urine to dryness, and extracting the residue with alcohol; the alcoholic solution was then evaporated to dryness, and water added until the residue had a syrupy consistence; to this oxalic acid crystals were added in sufficient quantity to form an oxalate with the urea present. d. Represents the general character of the crystals of oxalate usually formed in this manner. e. More perfect crystals.





X 215. p. 130.



Grystals of une acid. × 215, p. 139



oxalate of urea, obtained by adding oxalic acid to concentrated urine × 215, p. 132.

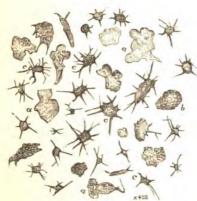


Crystals of indigo, u and b, obtained by sublimation.
c. small crystals in fluid. p. 148.



Surate of mea. a. mystals of mined from mrine; b, crystals of pure intrate of mea. x 210 p 131





Crystals of uroglaucine from the urine. a, small masses of a blue colour, b, composed of small spherical particles corystals of uroclaucine of a deep purple or violet colour. x 103. p. 148.



Wien Oblained Jeon with x 214 p 188.



Fis. 10.

R dan and Verdeil. p 112.

#### PLATE II.

# Urea, C2H4N2O2.

- Fig. 1. Urea obtained from urine crystallized in its own mother liquor.
  - Fig. 2. The same examined in the dry way.
- Fig. 3. Small crystals of urea formed in a concentrated solution of natural urea.
  - Fig. 4. Similar crystals of larger size.
  - Fig. 5. Artificial urea crystallized. Examined in the dry way.

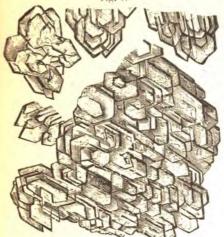
#### UREA.

Pure urea may be easily obtained by the decomposition of the nitrate or oxalate of urea. The crystals represented in fig. 1 were made by decomposing pure oxalate of urea with common chalk. An oxalate of lime is formed, which is separated by filtration, and the urea remains in solution. From the nitrate, urea may be obtained by adding carbonate of baryta — nitrate of baryta and urea result; the latter may be separated by evaporation to dryness, and extraction with alcohol, which dissolves the urea and leaves the nitrate of baryta.

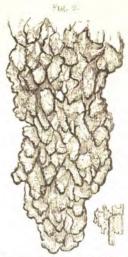
For the mode of preparing the nitrate and oxalate of urea, see page 132. Pure urea may also be obtained artificially by evaporating cyanate of ammonia to dryness.







lystals of intrate of urea (C2H4N2O2, HO, NO2) formed by adding excess of nitric acid to concentrated urine x 130, p 132.



Numes of uses formed by admir a mountity of outre acid not sufficient in combine with the whole of the uses pivisent. X 130. p. 132.

Fig. 3.



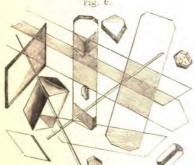
Nitrate of urea, obtained by adding a moderate quantity of nitric acid to slightly concentrated urine in a test tute, and allowing it to crystallize slowly. X 130.

Fig. +



Mirrate of ureal obtained by adding a marked excess) of mirro and X 130

Fig. 6.



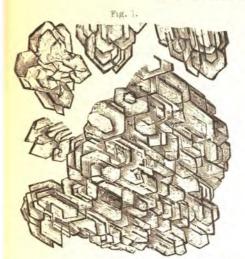
Crystals of pure nitrate of urea phismed by dissenting some of the nitrate in water and evaporating, so that crystals may form X 100.



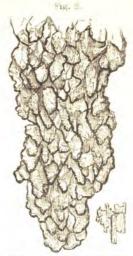
Situate of orest formed by admit, only two dangers mitric seen to highly consentrated artic. × 190

The then have to





Crystals of nitrate of urea (CgH4NgOg, HO, NOg) formed to adding excess of nitric acid to concentrated urine × 130. p 132.



Nitrate of mea formed by adding a mainthy of intric acid not sufficient to combine which the whole of the urea present. X 130. p 181.



Strate of urea, obtained by adding a modernic quotily of mitric acid to slightly concentrated urine in a test tube, and allowing it to crystallize slowly. X 130.

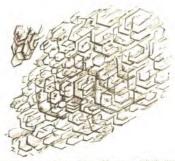
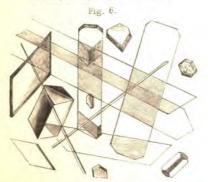


Fig. 4.

Narrate of urea obtained by adding a marked excess of utric acid X 130.



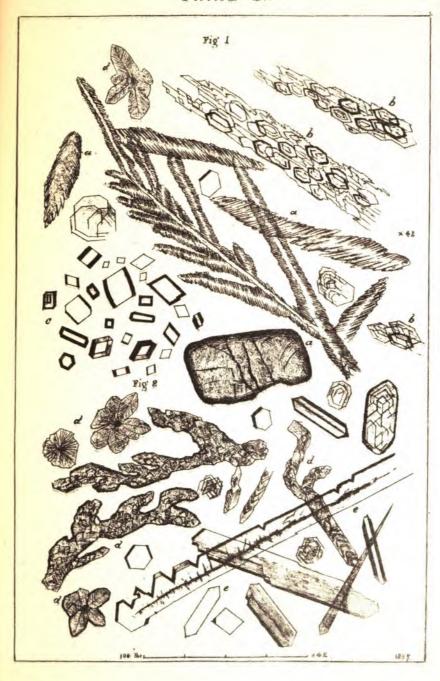
Crystals of pure nitrate of urea obtained by disselving some of the nitrate in water and evaporating, so that crystals may form X 130.



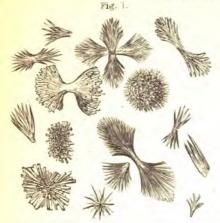
Nutrate of most bounded by adding, they tree directly militie aum to highly concentrated arms. X 140.

[To face Page 136.

# URINE -IV.



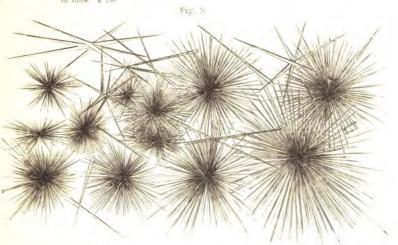


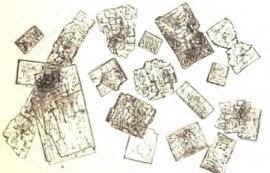


Urate of magnesia. Mg O, C<sub>10</sub>H<sub>3</sub>N<sub>4</sub>O<sub>5</sub> +6 aq. Csystallized in rates. x 130

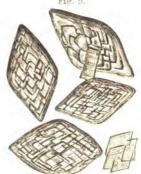


Urate of magnesia, showing the separate forms of the crystals. × 215.



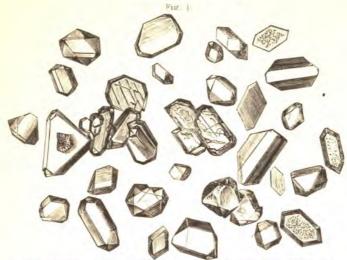


Orie acid. C10H.N.O. Presentated by adding hydrochlora acad to urate of potesti x 130



ric acid deposited from moss

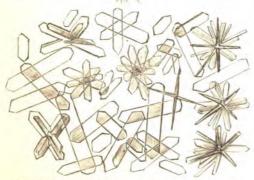




Alloxan.  $C_8H_2N_2O_8$ . Crystallized from an aqueous solution obtained from uric acid.  $\times$  42



Alloxantin.  $C_{16} H_4 N_4 O_{14} + 6$  asp. Prepared from unic acid.  $\times$  (30.



Larabanic acid. CaBaNaOa Othamici from one acid. x 150



Crystals of creatine. p 139.

FIE. 5.



Crystals of mosite. p. 280

Fig. F.



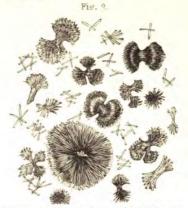
inctate of copper. p. 153.

To face pase 140.

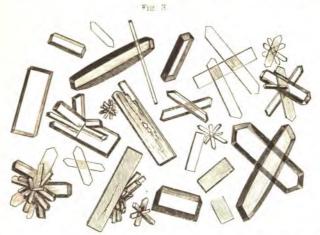




Unmpound of chloride of zinc and creatinine, as it is obtained from urne. (C<sub>8</sub>H<sub>7</sub>N<sub>3</sub>O<sub>2</sub>, Zn Cl.) × 29



Compound of chloride of vinc and creatinine after re-crystallization in water. × 215. p. 137.



Crystals of creatine outsined from the chloride of zine compound. Crystallized from an aqueous solution. × 130, p. 138

Fig. 4.

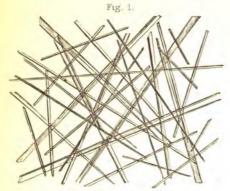


Coystals of creatiline obtained from the chloride of sine compound - x 130. p. 137.

1000 of an inch 1\_1 x 130. · × 217.

(To face page 143.

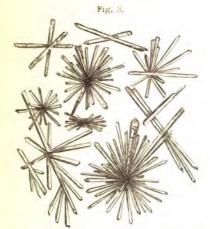




Alloxanic acid.  $C_8H_4N_2O_{10} \times 130$ .



Oxaluric acid. C. H. N. 208. × 11/4



Oxalurate of ammonia. NH3, CeH4N2O8, ×42, p. 153.



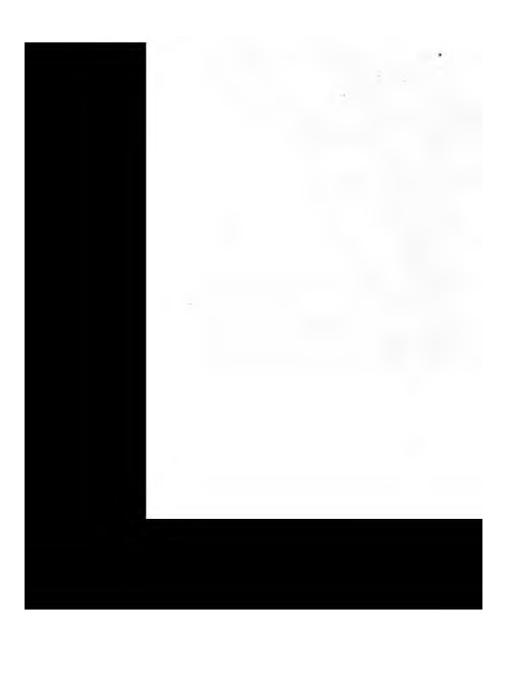
exalurate of time. Ca o,  $C_6 H_3 N_2 U_7 + aq$ .  $\times 42$ 



Oxalinate of magnesia MgO, CaH3N2O2+49 × 215.



Francis U. H. N. O. 8 130.



#### PLATE IX.

- Fig. 1. Alloxanic acid, C<sub>8</sub>H<sub>4</sub>N<sub>2</sub>O<sub>10</sub>.
- Fig. 2. Oxaluric acid, C6H4N2O8.
- Fig. 3. Oxalurate of ammonia, NH<sub>3</sub>, C<sub>6</sub>H<sub>4</sub>N<sub>2</sub>O<sub>8</sub>,
- Fig. 4. Murexide, C<sub>16</sub>H<sub>8</sub>N<sub>6</sub>O<sub>12</sub>.
- Fig. 5. Thionuric acid, C<sub>8</sub>H<sub>5</sub>N<sub>3</sub>O<sub>8</sub> + 2SO<sub>2</sub>.
- Fig. 6. Thionurate of ammonia, 2NH<sub>3</sub>, C<sub>8</sub>H<sub>5</sub>N<sub>3</sub>O<sub>8</sub>, 2SO<sub>2</sub> + 2 aq.

The alloxanic acid was prepared by adding baryta water to a solution of alloxan. The alloxanate of baryta so formed was decomposed by sulphuric acid, and the clear solution filtered from the precipitate of sulphate of baryta was evaporated and crystallized.

Oxaluric acid was obtained by treating a solution of oxalurate of ammonia with hydrochloric acid. The oxaluric acid was precipitated.

Oxalurate of ammonia was prepared by dissolving parabanic acid in ammonia. Upon heating the solution to the boiling point oxalurate of ammonia was formed, and crystals were obtained upon evaporation.

Murexid. Carbonate of ammonia was added to a warm solution of alloxan and alloxantin. The murexid separated in its characteristic dark red crystals as the solution cooled.

Thionuric acid. A solution of thionurate of ammonia in hot water, was precipitated by acetate of lead. The precipitate was suspended in water and decomposed by sulphuretted hydrogen. The sulphuret was separated by filtration, and the clear solution yielded crystals on evaporation.

Thionurate of ammonia. A cold strong solution of alloxan was mixed with a solution of sulphurous acid in water until the smell of the latter ceased to disappear after agitation. The fluid was then supersaturated with carbonate of ammonia, and kept boiling for nearly half-an-hour. Upon cooling, the salt crystallized in considerable quantity,



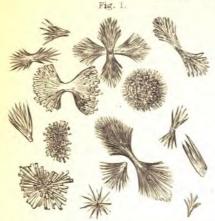
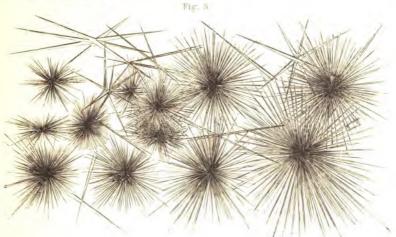


Fig. 2.

Urate of magnesia, showing the separate forms of the crystals.  $\times$  215.

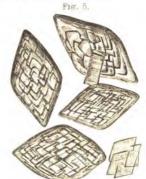
Crate of magnesia Mg O. CloH3N . O5+6 aq Crystallired in tufts × 130



 $\times$  130.  $\times$  215. Drate of time Us O  $C_{19}$   $H_3$   $N_4$   $O_5$  + 2 aq. Orystallized in thits composed of long accordance points.







Une acid deposition from 0/11 × 130.

Theo of an inch | 1 x 130 ,, ,, 1 1 × 015.

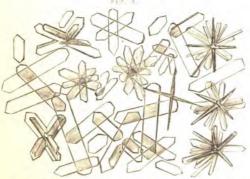




Alloxan.  $C_8 H_2 N_3 O_8$ . Crystallized from an aqueous solution obtained from one acid.  $\times 42$ 



Alloxantin C<sub>18</sub> H<sub>4</sub>N<sub>4</sub>O<sub>14</sub> + 0 uq. Prepared from uric seid × 130.



i arabanic acid.  $C_8 H_2 N_2 O_6$ . Unhamed from use acid.  $\times$  130



Crystals of creatine. p 138

Fig. 5.



Crystals of mosite. p. 280

Fig. f.

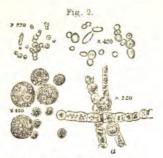


lactate of copper. p. 153.

To face page 140.



Fructification of penicillium glaucum, p 2:3.

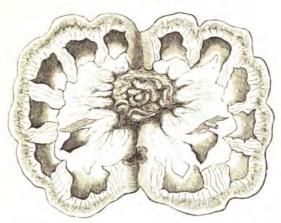


The sugar fungus from diabetic urine, p. 240



Fructification of yeast fungus p. 243.

F14 4



Human kidney, showing greatly dilated pelvis and calvees shrunken pyramids, and diminished cortical portion – p 180.

Fig. 5



Modification of Mitscherisch's polaris'nt saccharimeter for determining the proportion of sugar in fluids. p 252:

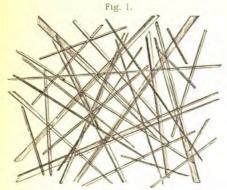
Fig. 6.



Flash adapted for the estimation of carbonic acid gas, used in determining the proportion of sugar in fluids by the fermentation test, p. 252

[To face page 259.

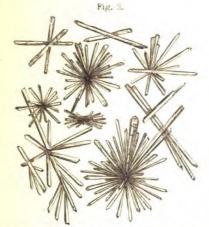




Alloxanic acid. C8H4N2O19 × 130



Oxaluric acid. CaHaNaOa. x 311



Oxalurate of ammonia. NH<sub>3</sub>, C<sub>6</sub>H<sub>4</sub>N<sub>2</sub>O<sub>8</sub>, × 42, p. 153



Oxalurate of lime. Ca U,  $C_0 \boxplus_3 N_2 \cup_7 + a_{ij}$ .  $\times 42$ 



Oxalisrate of magnesia MgO, CaHaNaO7+41 x 215

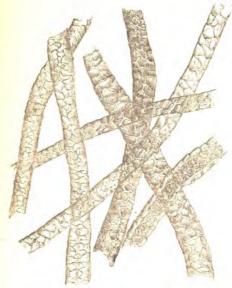


) rample:  $C_*H_5N_3O_6$ ,  $\times$  130.



### URINARY DEPOSITS .- EXTRANEOUS MATTERS.

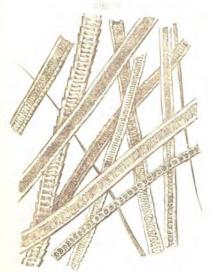
Fig. 1.



ntions of hairs from a limber to line provi-



Fractions of human hair. In two the central commencerapied with the soft colls of the medians is represented. X 130, p. 39.



Fragments of cur's halo. Some of them near the appeared theree-lose to the motor the ham. x (30) p. 294.



X -1 1 05.



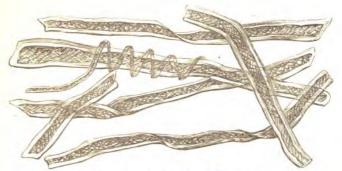
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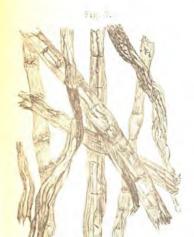


# URINARY DEPOSITS, -EXTRANEOUS MATTERS.

Fig. 6.



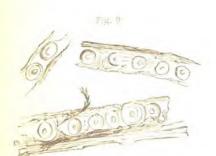
Contro these sects shall flore in the upper part of the figure is seen to be twisted model a larger one. x 215. p 39



Fortions of thex fibres. x 215, p. 294.



Particus of feathers. The knotted prices represented are obtained from the lower part of the shart of the feather. × 210 p. 294.



ritures at deal would award from the floor



Elements of dust swept from a shelf:

mun of an meh \_\_\_\_ x 015.



# URINARY DAPOSITS -EXTRANEOUS MATTERS.



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Without a Mill of the Co. No.





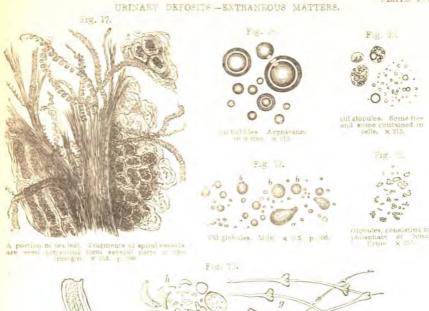
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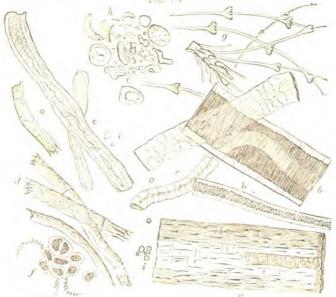


arrollen and the media of the media of the media



College resumer potato in which the starch is colleged. A has if the cells are filled with sometimes grounds X in p. 3



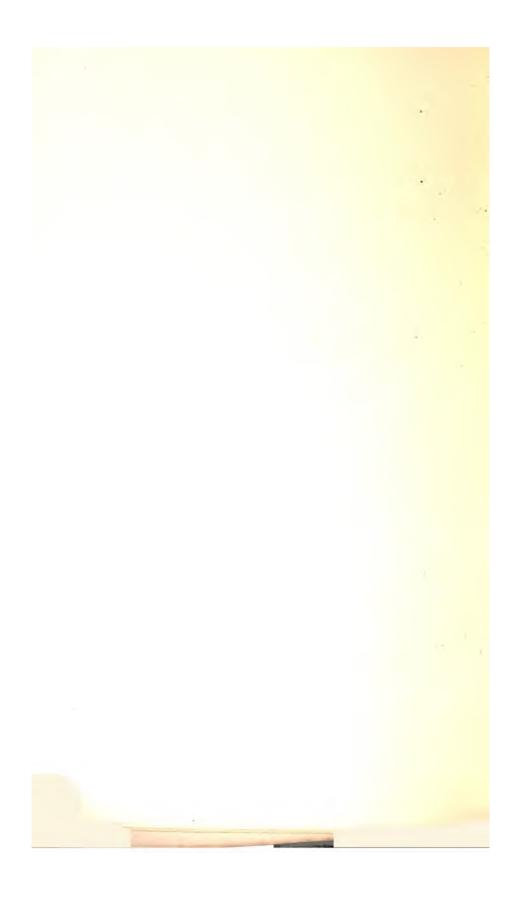






Pritbelium apil fingi from the mouth, work, p. 27

Pain of an Anch . . x 15.





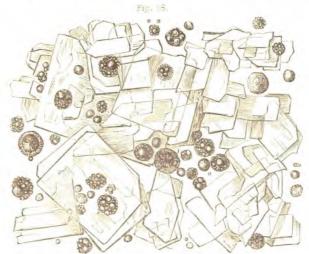
Unite of soil; obtained by consequentiating healthy unite × 21 f p 107



Molecular fatty matter of chynois urine, p 200



Urate. Ordinary granular deposit, usually termed trate of ammonia. p. 297.



Crystals of chole-terms, obtained from the futty matter in casts separated from the urine of a case of fairy degeneration of kidneys, × 315, p. 31.



Pus and blood corposeles, with crystals of triple phosphate, from the urne of a mad suffering from fungus growths connected with the mucous membrane of the bladder, x 215, p 315.

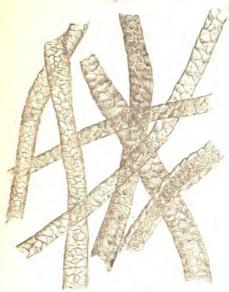


the grounds of mile. x 20



# URINARY DEPOSITS .- EXTRANEOUS MATTERS.

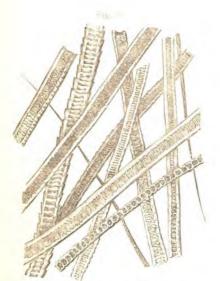
Fig. 1.



1 without of hairs from a blanket x 100 p =0.



Praxments of himan hair. In two the regular and compact with the sent pells of the medulat is legue sented.  $\times$  180. p = 01



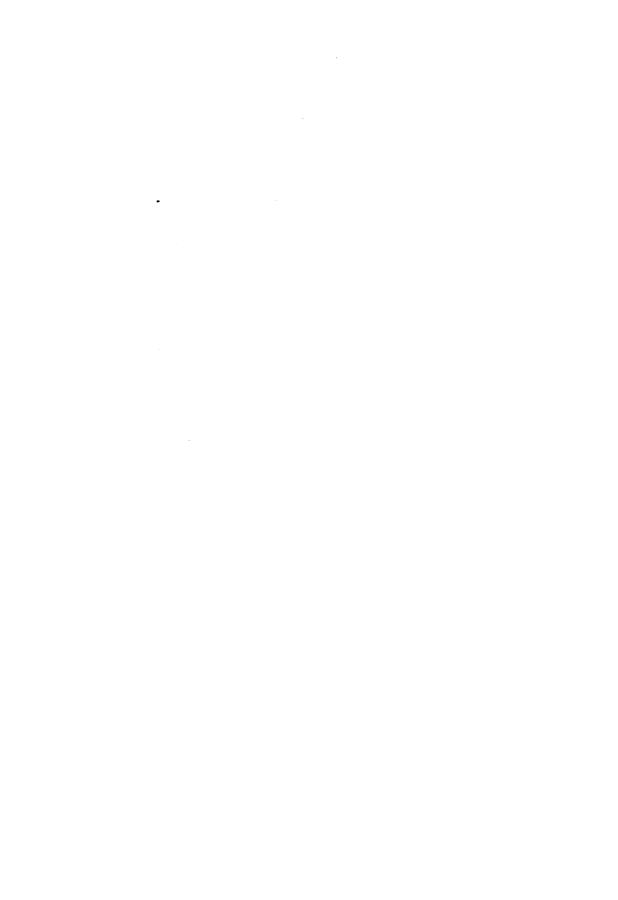
Pragments of pare halo. Some or those mear the apex, and others close to the root of the haro. × 130 p. 234.



Prime of still w. Flore still h (nok still 8 -1) in



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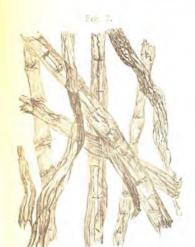


## URINARY DEPOSITS -EXTRANEOUS MATTERS.

Fig. fi.



Forms these stands there in the upper part of the figure is seen to be twisted rested a larger one,  $\times$  2%. p. 291



Portions of that fibres | x 215 | p. 294



Fortions of feathers. The knotted pieces represented are of from the lower part of the shaft of the leather. X 210 |



it res of deal wood exept from the floor



Elements of dile excel from a shell x all p and

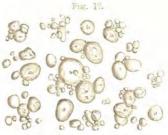
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# URINARY DEPOSITS .- EXTRANEOUS MATTERS.



Potato sine h its angurance in water x 215 it wa







Testa and inner tunies of the wheat avain-









A portion of tealest. Fragments of spiral vessels are seen properties from several parts of the imagin. N 215, p. 36



Alphabbles Appearance



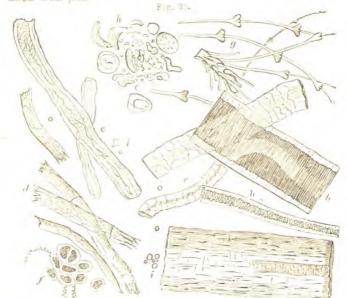
Dil globules. Some free and some contained in



Oil globules. Milk. x 215. p. 300



phosphate of lime.



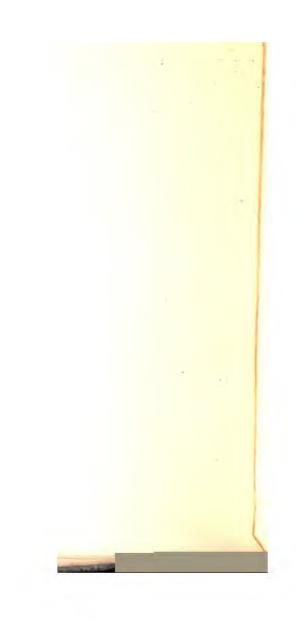
and the first the series of the property of a with an incidence of 2015



Buthelium and hings from the mouth, with putt



Portions of partially digested striped muscle From count × 11 p /07





Urate of sodi distained by meentraining healthy mine

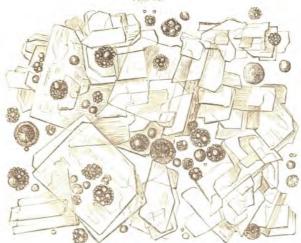


Molecular fatty matter of chylines urine. p 309.



Urate. Ordinary granular deposit, usually termed urate of ammonia. p. 297.





of a case of fatty degeneration of kidneys. X 21% p 31)





Tue and blood corpuscies, with crystals of triple phosplints, from the urms of a man suffering from fundus prowips connected with the mucous mentions of the blander. × 215. p. 518.

Fig. 504



transformer or mile, (x-10)











Alge and vibriones from urine three days after it was passed. × 408.





normal a different forms







Fig. 38. 0000









the medium dancum, from and



the sucar mens from it shells urine





(To face pace



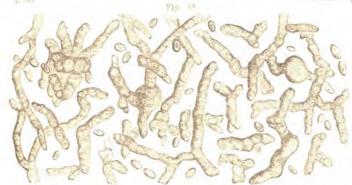








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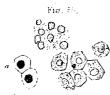






## "RINARY DEPOSITS .- EPITHELIUM.

p 327.



Epithelium from the convoated portion of the unit terous tube **a** treated with as the acid. **x** 215.



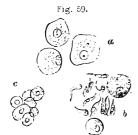
Epithehum from the pelvis of the human kidney. × 215.



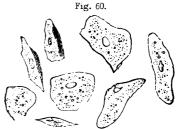
Epithelium from the ureter. × 215.



Epithelium from the urethra. × 215.



Find der epithenium. a, from the general surface b, from the fundus. c, scaly epithelium from the bladder.  $\times$  215. p. 3.7



Vaginal epithelium from urine. × 215. p. 308.



Equitioning from the Fluider, showing the bolows in some of the large color into which the subjacent columnar color fit. § 327



Epitheliam from the vagina. p. 528.



and -paths of  $\alpha$  . In the harder, and regard envision,  $\times$  500, p. 325.



r imation of pus from germinal matter of epithelial cells. X 215. p. 328

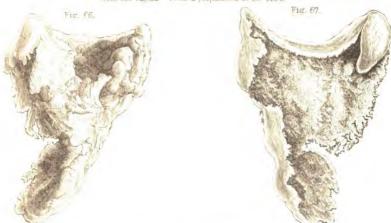
from of an arch ,  $\underline{\phantom{a}}$  ,  $\times$  2.5.  $\times$  7.0.

(To face page 324.

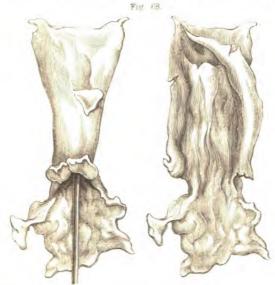




nanous substance passed with a blood plot doining the menstrial period, probably from the vagina. From a preparation of Dr. Tilt's.



I We trughten is of a merine case passed by a hidy, age 35. These are composed emirely of epithelium



tend inverted ten a drawing by the Vannon of Photoco.





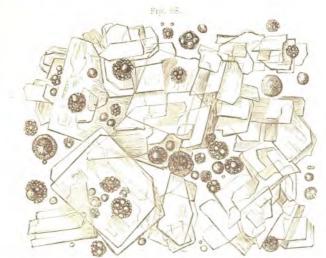
Urate of sods obtained by someotrating healthy urms x x12 y x07



Molecular fatty matter of chylons urine. p 190.



Urate. Ordinary granular deposit, usually sermed urate of ammonia. p. 297.



-Obstals of cholestrone, chiained from the fatty matter in casts separated from the urine of a case of fatty degeneration of kidneys. × 215, p. 311.



rus and blood corpusales, with crystals of triple phosphate, from the urine of a man suffering from funding growths connected with the mucous membrane of the bladder, X 200, p. 318.



Oil globalew or mak, 🗴 💯







Pentillium staucum, developed acid urine. a. within twelve hou after the urine was passed; b, r itay after; e, two days after; days after; after standing six days. p 322.



Algae and vibriones from union three days after 16 was passed.  $\times\,403$ 

Fig. 34.









morthum glausum, sound in ill metre usine non days after il was passed. X 210.









the sucar limit is from drabenc urino.

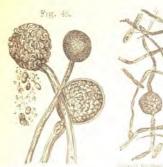




× (800). [To face page 5





















Penicillian clascum, tomos entre, je 200.



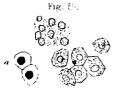


Thom of an inch x 200.

 $_{1}$   $\times$   $_{7}$   $_{0}$ 



## "RINARY DEPOSITS.—EPITHELIUM.



Epithelium from the convoluted portion of the unniterous tube **a** treated with acetic acid **x** 21%.



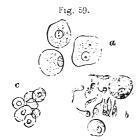
Epithehum from the pelvis of the human kidney. X 215.



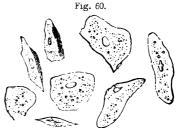
Epithelium from the ureter. x 215.



Epithelium from the urethra. × 215.



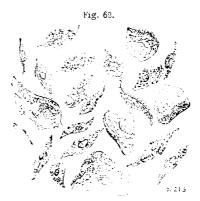
Fladder epithedau a, from the general surface b, from the fundus. c, scaly publishment from the bladder. x 115 p 3.7



Vaginal epithelium from urine. x 215, p. 308.



Epithedian from the Bladler, showing the holder in some of the lance constant which the subjacent columnar cells fit. § 327



lightheliam from the vagina. p. 328.



rate paths of the constraint and earling anything  $\times$  700.  $\pm$  327.



r imation of pus from derminal matter of equitibelial cells: × 215. p. 318

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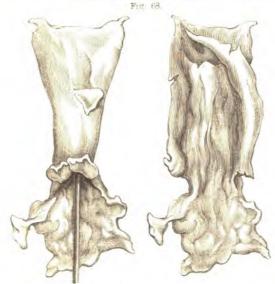
Fig. 65.



Membrane is substance passed with a blood only doing the mentical period, probably from the vasina. From a preparation of Dr Tilt's.







Take = (i) Yours and called the manners reverse polarization the former cavity. Fifth the seed of some distribution by the Variance of Floridae.

•		



Custs' of the seminal tobes. Spermatorou emissited in them From an old man upwards of su years of age. p. 831



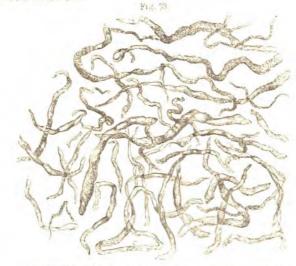
Spermatozoa and cells of vaginal epithenum, removed from the vagina of a little girl a few hours area rape had been committed X 210. g 330.



× 215, p. 329.



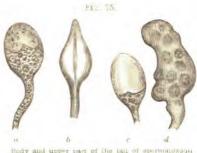
represented upon them



cong narrow threads of theid moons, associated with the presence spermatozon in casts of the seminal bubbles. From the urine of a case of shebt irritability of the read of the blodder. X 210, p 331.



claments of a vegetable nature resembling aperins of the X 403. p. 331



Body and upper part of the tail of spermatowoon magnified upwards of 3000 diameters a spermatoroon containing much living germinal matter b, the same seen edgeways, e, spermatozoon containing comparatively little germinal matter d, spermatozoon crushud, showing separate spherical particles of germinal matter p, 300

mus of an inch \_ x 215.







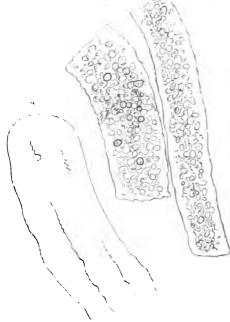
Spermatozoa and crysta's of phosphate of lime, to in the seminal fluid,  $|\chi|^{215}$  -  $p,\,3.9$ 

Fig. 73.

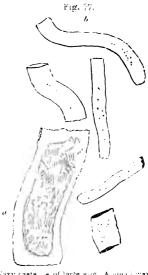


Casts containing oil globules, and free far cells, from a case of fatty degeneration of the kidney. X 216





Targe casts. Some continuing many selfs others consisting



Waxy casts. a.of large size b small maxy casts. × vib

12. 75A

Small granular casts, from the name of a patient suffering from chroni nephrans × 2.5



Fortbolid cases | a class scannanna cells | republic m | b case | manna & sunda | mutto. | Feron unno ef acute di sper,



Fig. 81.



Mucus cast, from the strught portion of the undifferous tubes, showing the manual in which the large renal tubes its are and subdivide as they pass towards the base of the pyramids  $\times$   $\sim$  p,  $3P_{c}$ .





Muons casts, with dark brown urate deposited upon their surface and in their substance. They became mite clear am transparent when warmed \$2.00, p.30.

Fig. 84.



Portion of a mucus cast, which has been formed around a smaller and serpentine one. x 215 p 342

room of an inch | 1 x 2/15.

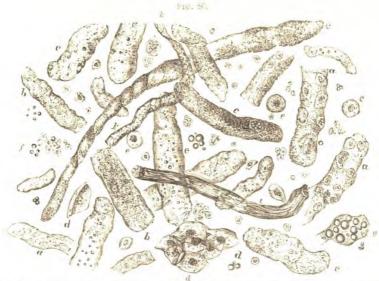




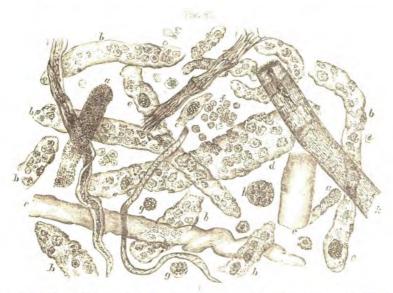
Waxy casts of large and smaldameter. In the centre of the larger ones casts of small distinctor are seen to be embedded × 50. p 340.



Casts containing blood corpuscles, from a case of scute nephritis. x 215. p 342.



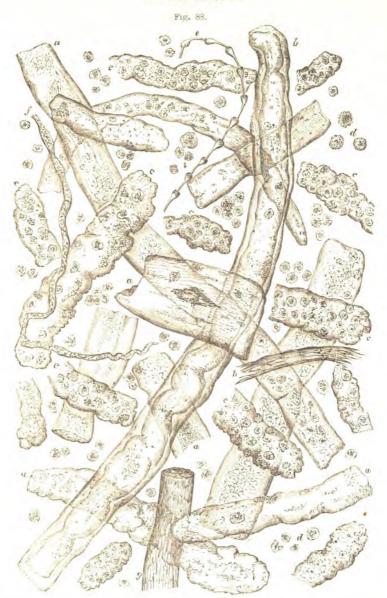
Epithelial and granular casts from the arms of 'a woman suffering mont scale negligible with those, of a fortnight's duration. a, spithelial casts, the cells of senal epithelium are very distinct, and then uncles well defined. b, casts containing brown granular matter and blood corposcles. e, granular asks of a brown colour many of them containing a few oil globales d, spiannous spithelium from the value e spithelium from the bladder. f, cells containing oil globales, g, parties of a cast containing oil globales. A circular ferantial cells probably altered renal spithelium. f, flore of flax of accidental presence. k blacket hay x 15. p 347



Casts from a case of chronic nephritis. a dark grammer rusts b, rusts which conditions small granular calls and white blood corpuscies c, a waxy casts, consisting of a perfectly clear glistening material. d, large cast fattened by pressure, containing white blood corpuscies, c portion of a cast containing a large cell filled with oil globules. f, purcospinates, probably derived from the bladder g, collections or small oil globules. h, the coll containing smaller cells in the universe f of the nature of the nat

ronn of an ench | x 215.





Cases, and Hillamonicon the kniney,

Costs from the name of a man aged th suffering from acute inflammation of the kidneys. There was very which coloring to the lega. The patient died commons three weeks after the first symptoms appeared. The urine conducted so much altiment that it became perfectly solid upon the application of heat and after the middle of middle and after the middle of middle and after the solid perfectly solid.

a price of the parent way-like case. The shading should be more facts than in the drawing. b, a very long was like case, consisting of material deposited at two different periods; the original cast in the interior was probably forced a certain distance further down the unintercus tube, when a new layer of the coagulable material was deposited around it. c. casts filled with calls closely resembling pus corpusates, but somewhat larger d the same rolls free in considerable number; the greater part of the deposit consisted of these casts. e portion of feather. f piece of cotten fibre, g portion of human hair h flax fibre x 21s, pp 34, 3s.







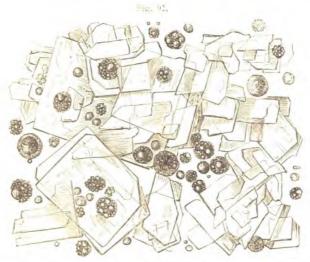
tasa. Choun deponda

a. casts of large diameter, containing aramilar matter scattered through them unequally. b. a very long, clear and perfectly transparent cast, containing only a few minute oil globules here and there, c. dark granular casts, some of them containing a few oil globules. d. large masses of translar matter, many of them appearing like granular calls. Most of these are derived from the mucous membrane covering the glams. e, cells of renal spithelium, darker and more granular than usual f, mass of squamous epithelium, probably from one of the follows of the mucous membrane of the bladder. g. free oil globules. k, portions of cotton fibre. 4, portion of feather. × 110. pp. 543-349.

inon of an luch 1 x 215.



table remaining (a) from the units of a case of fatty degeneration of the kidney of long standing. Many calls of calls of any fatty degeneration of the kidney of long standing.



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clasts while numberous tabes, from a case of arute nephrans  $\times$  310. pp. 340–348.



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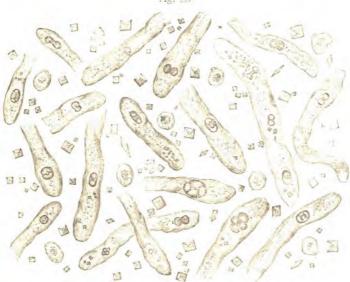
elion of a cost with descripted periods with altered winte (and response). • • • • • •





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Fig. 26.



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P. H.









Units of soda, prepared artificially x 215 p 351.

Fig. 90,



rined to the surrance of the contract tirine.

# Fig. 100.



tate of annuonia prepared actificially. × 218. p 351

# Fig. In.



subgraves of male of soda, with crystals of order and Prem a case of many ventralised tendition fever. Sept by 2) Kennion, or

# Fig. 102.



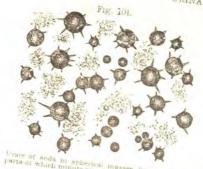


X =0, p, do;

name 2 au men L\_1 × ...

To tace pure





Frate of soda in spherical masses from various parts of which minute decular crystals of the adm protect x 245, p 332.



thouse of such in a probability form, is minimized in the uritie of abildren | X 215, 45,552



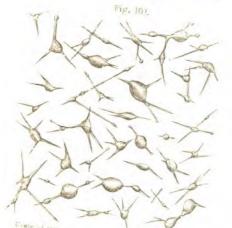
Crystals or ominening magnesian phesphare, with mates, much samples conjunctes. From a case of catarin of the bladder of a man new to. Trans' standing p 355.



Pis. Its.



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peniform) some of this of unincome ornagues an phosphate and spheriles of state of such 8 att. pp 357, 350

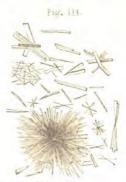


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Casts at the armiferous tubes, from a case of scate nephrons,  $\times$  210, pp. 345–348



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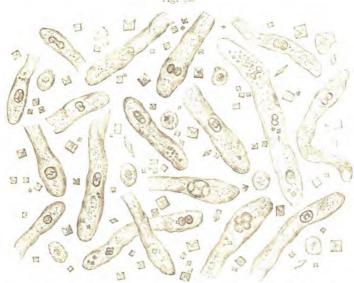


ction of a cast with distinct cells, probably altered white blood corporates. x 500.



Brivelled and wasted origin rous tubes from a kniney.

Fig. 96.



Domb-bell erystals in casts, troving this these cusque oryents are formed in the attributions tables. From the unite of a case of choicers. The specimen contained these casts was the first portion passed after eighteen hours complete suppression. It contained a time of albument fortaled a were present in the surrounding that, will be a proving the present of the suppression.



Fig. 97.

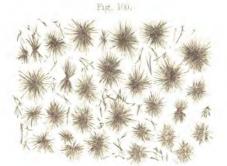
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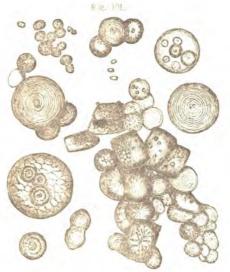
Unite of sods, prepared artificially x 715 p 351.



- da and fring at triple phosphare, growd an the surrow of a six-hiratel frome, p. 500



Haus of amonomia prepared artificially. x 215. p 351.



Let use of trate of soda, with crystals of trio acid. From a seriousised (emitted fore), Solit by Dr. Kenmon, of arroyme. 8. — p. 800.

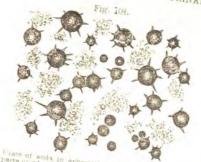


rate of ammonia, prepared armicially. x 215 p 851



de al ammenia, prepared addicially,

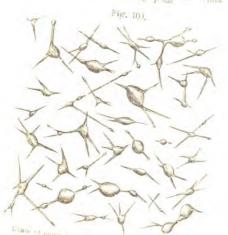




trate of soda in substruct masses from various parts of which minute administrative files of una sout project X 213, p 432.



Cystals of summerime numbersian Phosphate with unates runcins and puts corposeless. From a case of the blagder of a man ske to trace of the party standing p. 350.



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These of solid III of Indiana form, argumently count in the more of violation × 210, p. 502



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will have a superior and trape on animomorphic manufactor in phosphare, and spheroles of object of some \$10. Jp. 350, 350.



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C years at trule (hosphus and phosphus of since  $\times 150,\; p.\, 366$ 









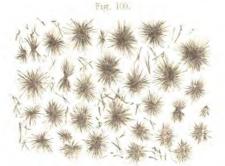
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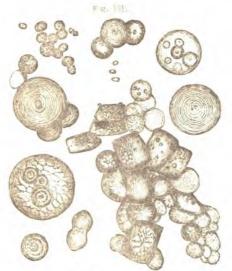
Unite of sods, prepared artificially | x 215 p 351.



i da ami films o unpis phosphate.



Trace of ammonia prepares artificially. x 215, p 351.



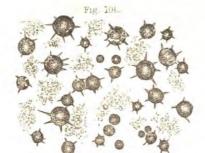
intries of some of soda, with crystals of title and From a series of someon tymitted treer. Soot by Dr. Kennion, of



artificially. × 213 p 301



x .10. p. 01.



Urate of soda in spherical masses from various parts of whole minute accordar grandle of time and project | X 215. p. 302.



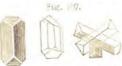
Crystals of monocome, modowska phosphar will mates, monos and pus ospassions. From a case of stater of the bladder of a man age 40 Mineral Company of the phosphare standing p 350.



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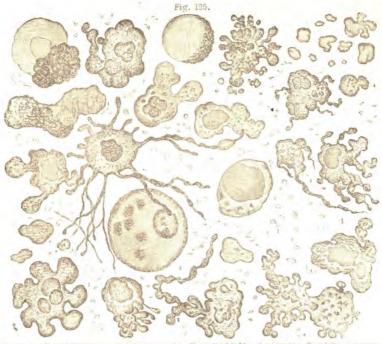
Oystals of triple (hosphals and phosphale of mine 2 (30, p. 3)



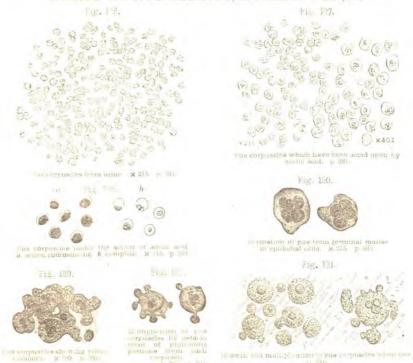








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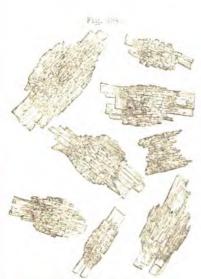


## TRINARY DEPOSITS





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Described appreciations of unc acid × 215

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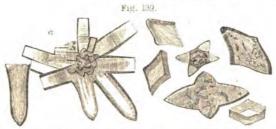


Fig. 137. Uric acid from urine × 130

Large fiddle-shaped flattened crystals of uric acid × 130



Christia forms of time acid from tirine ox 215.



Large hulbert-shaped crystals of aric acid  $u_{\rm t}$  -tayenne-pepper' grain  $\times$  215.







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# URINARY DEPOSITS.



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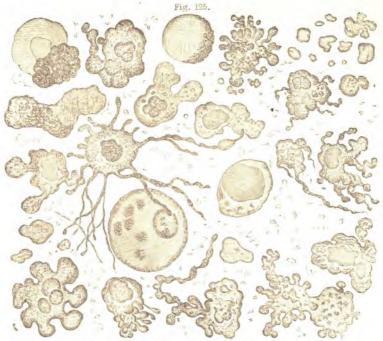
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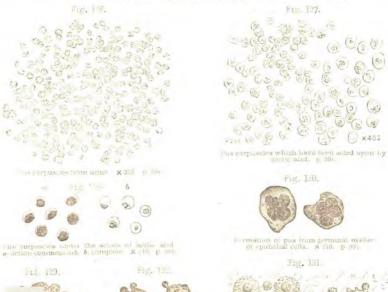








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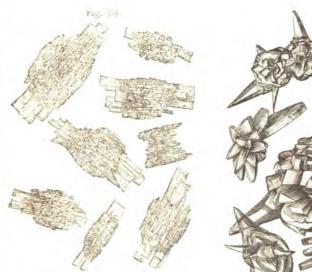
## WRINARY DEPOSITS





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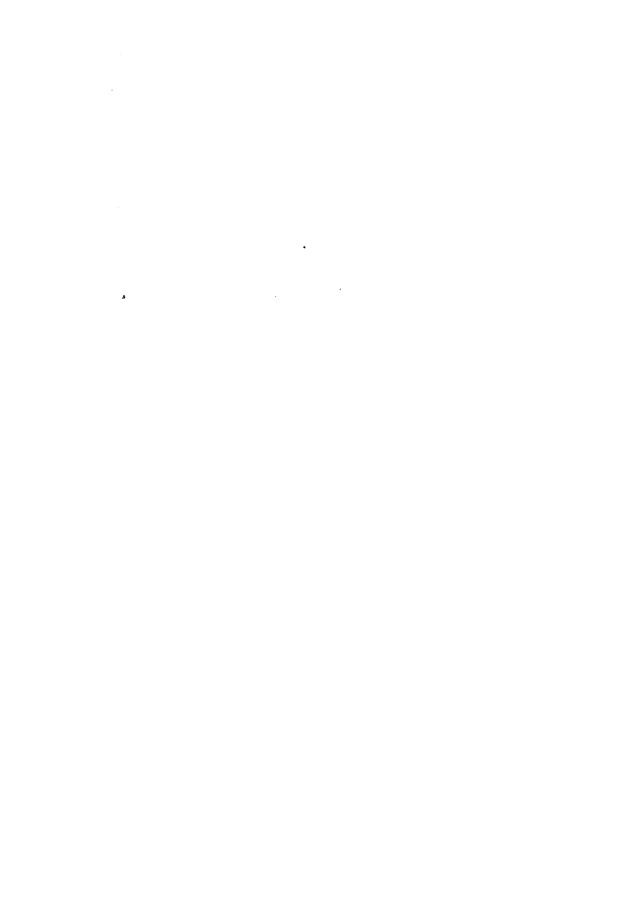






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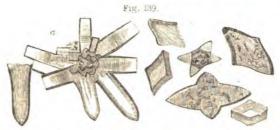


Uric acid from uring × 130





Curious forms of and said from arine x 21a



Large Labert-shaped crystals of une acid | e, 'cayenne-pepper' grain × 21b.

 $\tau_{000}^{-1}$  of an inch  $\underline{\phantom{a}}_{1}$  150.



Minute crystals of unc acid × 215

. .

Fig. 141.



Curious lamellar crystals of uric acid, perfectly colourless. Sent by Mr. Lawrence × 215

Fig. 143.



Urystals of uric acid from urine.  $\times$  130.



Common rhomboidal and cubical forms of uric acid from urine. × 215.

Fig. 142.



Lozenge shaped crystals of uric acid, precipitated by the addition of acid to urine × 215.

Fig. 144.



Lozenge-shaped crystals of uric acid obtained by adding acid to urine.  $\times$  215.

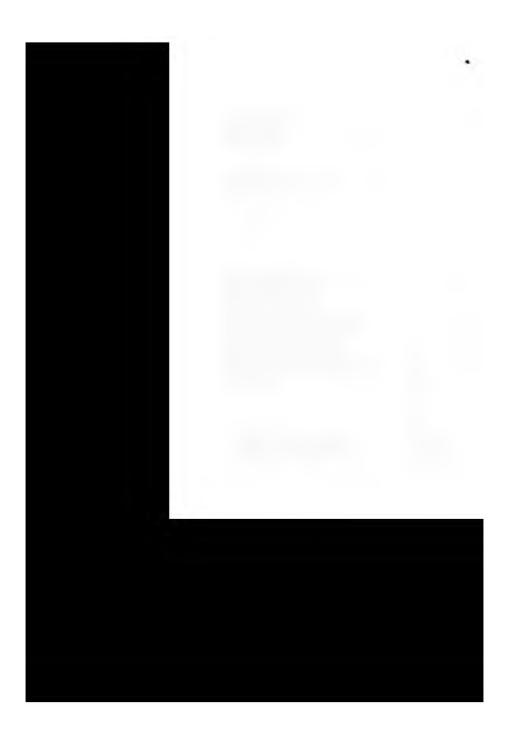
Fig. 145.



Common forms of une acid crystals.



Large crystals of uncacid, deposited in unine after standing,  $\times$  130



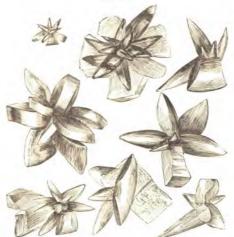


Rhomboidal crystals of urreacid Very common form x 210



Currous forms of aric acid, deposited in the unite of a case of fatty degeneration of the kidneys  $\times$  130

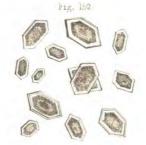
Fig. 150



Large, very transparent glomeruli of uric acid, from urine. x 130.

Fig. 101.

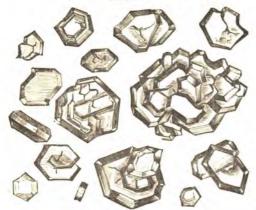
1. un to read aparticular muses of una hold tepo of them. In X 21-



Hexagonal crystals of uric acid. This form occurs in litrue very rarely x 100

Fig. 154.



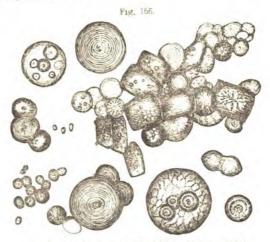


Small crystals of uric acid of a rhomboidal form; many of them resemble sections of small cylinders





a. large spherules of urate of soda b, film composed partly of urate of soils and partly of urate of the soils and partly of urate of the acid. From the urine of a case of loud-continued billows and remittent fever. Sent by Dr. Kennien x 42



The spherules of trrate of soda (Fig. 155) more highly magnified. × 215.



Dumb-bell-like crystals of uric acid, obtained by adding hydrochlone acid to urine. Sent by T. W. Roper, Esq. x 219.



Crystals of uric acid, partly disintegrated, From a specimen which had been preserved for many years in the naphtha and creosote fluid.  $\times$  215.

1000 of an inch \_ × 42. n ... L x 31

[To follow PLATE XXVII]

PLATE XXIX.

URINARY DEPOSITS.

m: - 120

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PLATE

## URINARY DEPOSITS

Fig. 161.



URINARY DEPOSITS.

PLATE XXXI.







## URINARY DEPOSITS.

Fig. 176.

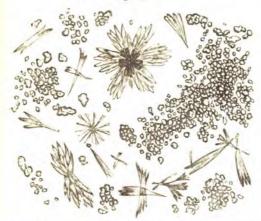


Modified forms of oxalate of lime. From the urine of a man who was poisoned by oxalic acid. p. 389 × 215



Some of the crystals in Fig. 176 magnified 550, p. 38

Fig. 178.



Penutiful feathery organis of phosphates of lime and magnesia, with collections of ontahedra of exalists of lime, the angles of which are resemble, place with



Small globules and octahedra of oxalate lime.





Beautiful crystals of triple phosphate, exhibiting peculiar markings resulting from partial solution. X 215.



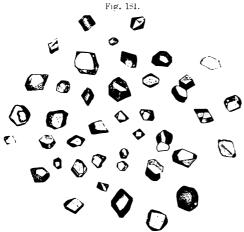
Crystals of triple phosphate; the passmatic portion is which is defective, and casts containing oil from the urin of a patient suffering from choose nephritis with partilatity decempation, p. 32.

too of an inch , , x 215.



#### PLATE XXXIII.

#### URINARY DEPOSITS.



whold from at triple phosphate or phosphate of lime and triple phosphate. 🗶 150. Sent by Mr. Richardson, of Dublin.



cetahedra and dumb bells of oxalate of lime, and curious forms of fund found in the urine of a young man passing much oxalate of lime. X 215

Fig. 184.



Fig. 182.



Collection of dumbibells firmly adherent to each other. Such a mass might very easily become converted made a small calculus by deposition a material of a similar composition in the intervals made in 379 × 215.



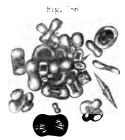
Minute crystals of oxalate of lime, with sporules of fundi resembling blood corpuscles. × 215.

Fig. 185.

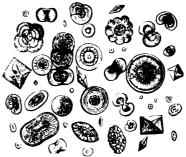


Perfect dumb-bell crystals from the urine of a child, two years old, suffering from jaundice, p. 379. X 215.

Fig. 187.



Pumb bell crystals of oxabate of lime accresated together, and forming a minute calculus. p. 379 × 215.



Spherical, oval, and dumb-bell crystals of oxalate of lime, with larger spherides, which may be regarded as microscopic calculi. × 215

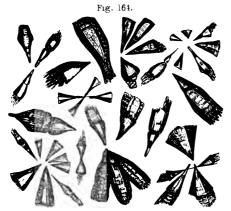
.  $\frac{1}{1000}$  of an inch  $|\mathbf{t}| = 1 + 2.5$ .

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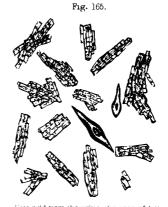
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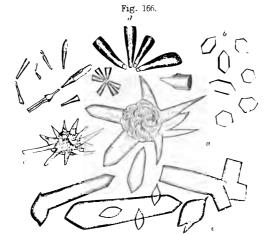
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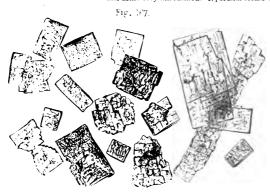
Geograficated pyramidal crystals of uric acid. Precipitated from urine by nitric acid. 🗶 215. p. 371.



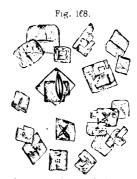
Unc acid from the urine of a case of fatty degeneration of the kidneys. × 45.



Less common forms of unclassed crystals a, crystal like cayenne-pepper fram. b, six-sided crystals e, mass with small unclassed crystals projecting from it. a, small pyramidal crystals of unclassed crystals of the acid, very uncommon. e, peculiar forms of unclassed

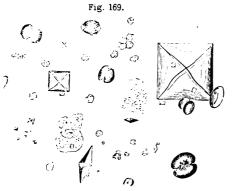


Irrefulacity shape i c ysaaline plates, consisting of uric acid. From urine  $-\mathbf{x}$  210



Two forms of uric acid. From a specimen of urine sent by Mr. Atchlev x 45





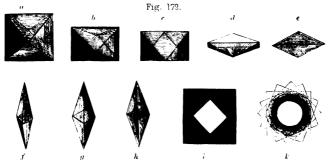
pell and octahedral crystals of oxalate of time. One very large edron is seen at the right-hand side of the figure.  $\times$  215. p. 378.



Fig. 171.



Curious prismatic crystal of oxalate of lime. p. 375



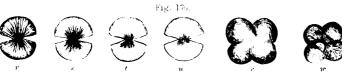
c.d. c. to illustrate the appearance of the same octahedron of exalate of time viewed in different positions crystal is supposed to be seen first lying upon one of its broad surfaces, and then tradually rotated from isserver until one edge, is opposite the eye. I, g, h, the same crystal seen sideways one of the lateral analysis towards the eye. I, the appearance of an octahedron when mounted as a dry object. It unusual form of compound crystal of oxalate of time. p. 375.



Circular and oval forms. p. 317 Dumb bell crystals and allied forms of oxalate of lime. p. 377



ell crystals and allied forms of exalate of lime. Crystals approximating in form to the perfect dumb-be



errect dumbbell crystals of ovalate of time which have two algested to the prolonged action of weak acets and, by which nuch of the salt has been dissolved out from the ordan matrix which exhibits the appearance of a cell wall plate.

dasses consisting of two dumb bell crystals oned together.



#### URINARY DEPOSITS.

Fig. 176.

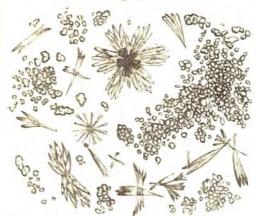


Modified forms of exalate of lime. From the urine of a man who was poisoned by exalic acid. p. 382.  $\times$  215.



Some of the crystals in Fig. 176 magnified 550. p. 38

Fig. 178.



Seautiful feathery crystals of phosphates of lime and magnesia, with collections of celabelita of calabe of lime, the angles of which are municipal p 350 x 215.



Small globules and octahedra of oxalate



Beautiful crystals of triple phosphate, exhibiting peculiar markings resulting from partial solution. X 215.

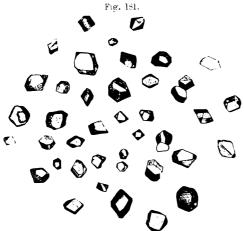


mon of an inch , x 215.



#### PLATE XXXIII.

#### URINARY DEPOSITS.



with different ct triple phosphate or phosphate of lime and triple phosphate. × 150. Sent by Mr. Richardson, of Dublin.



cetahedra and dumb bells of oxalate of lime, and currous forms of fund found in the urme of a young man passing much oxalate of lime. X 215.

Fig. 184.



Dumb-bells subjected to the prolonged action of acetic acid, showing the crystalline material nearly dissolved away. p. 377.

Fig. 182.



Collection of dumbibells firmly adherent to each other. Such a mass might very easily become converted made a small calculus by deposition a material of a similar composition in the intervals p. 379 × 215

#### Fig. 183.



himute crystals of oxalate of lime, with sporules of tung; resembling blood corpuscies. × 215.

#### Fig. 138



Perfect dumb-bell crystals from the urine of a child, two years old, suffering from jaundice, p.379. × 215.

Fig. 187.



Termbo bell crystals of oxidate of lime abgregated together, and forming a minute calculus. p 379 | x 215.



Spherical, aval, and dumb-bell crystals of avalate of lime, with larger spherides, which may be regarded as microscopic calculi.  $\times$  215.

 $_{\bar{1000}}^{1}$  of an inch  $_{1}$   $_{1}$   $\times$   $^{2}$  5.



# URINARY DEPOSITS. PLATE XXXIV. Fig. 188. Fig. 189. Unystals of cystine p 383 × 210. Orystals of cystine from the urine of an insane patient. Numerous crystals of aric acid were also present in the deposit. p. 383. $\times$ 215 Fig. 193. Fig. 191. Fig. 192. Crystals of carbonate or lime, seen by reflected light p. 357 Fig. 126. Irregularly formed crystate of cystane, formed by allowing the ammoniacal solution (Figs 190, 191) to evaporate to dryness. X 215. Closters of crystals of cystine formed by evaporating a solution of the crystals represented in Fig. 188 in ammonia × 215. Six-sided crystals of cystine, formed from as lution of the crys-tals in ammonia. Crystals of carbonaus of lime, in Canada balsain, seen by transmitted light. p. 3% Fig. 191. Fig. 195. Fig. 199. Epithelium from the u.m.-terous tubes and pelvis of the kidney, with framiles of colouring matte, embedded in them. p 390 × 215 bronchitis, p.395 Fig. 20). x 215 Blood corpuscles, a, h, c, taken from the living body; d, e, f from the urine d, corpuscles smaller than natural; at t their circumference is serrate and ragged; and at f a somewhat similar appearance is shown. Fig. 197. - 008.

Tuberds corpusces from a tuberds in the long p 391 x 210

Cells found in the urine of a case of renal dropsy p. 30

Altered to durant classes one retinal successions ip 988

[To face page 302





Rhomboidal and feathery crystals of hamatoidin from a softened clot. Human, p 389, × 215.



Feathery crystals of hæmatoldin found in the urine a fortnight after slight rupture (7) of one kidney, Human subject p 389. x 215

Fig. 205.



Cancer cells from the urine in a very bad case of cancer of the uterus.

deposit was very abundant. p. 394.



Cancer cells found in unne From the bladder. p. 394.



Cells from the unne of a case of acute rheumatism. a in the natural state. b, treated with acetic acid. c, resembling pus. d, the same treated with nectic acid. The small circular bedies are blood corpuscles. p. 305.



blood thats in the form of prequincly shaped cords. From the vacuus, found in urbus, p. 390. x 215.

 $\eta_{BBM}^{-1}$  of an inch  $1 - 1 \times 215$ . All these agures x 315

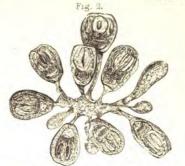
÷ ...

•

Fig. 1.



Layers of which the wall of an hydatid cyst is composed. p. 397.  $\times$  215.



Echinococci from hydatid. Liver of ox. p. 395. x 10. Fig. 6.



Felanococci p 398. x 42.





Hookist of echinococcus, p. 399, x '00.



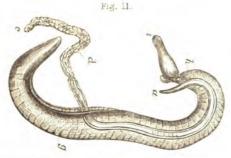
Diplosoma crenata; one-half the real size. After Dr. Farre. p. 399.



Ova of bilbareja hæmatobia in urmary deposit. Drawn from a preparation of Dr. Harley's. p. 401. × 15.



Tania echinococc p. 398. × 15.



Bilharvia hæmatobia. a, c, d, the female lodged in the synæcophone canal of the male, h, i, g. After Bilharz.

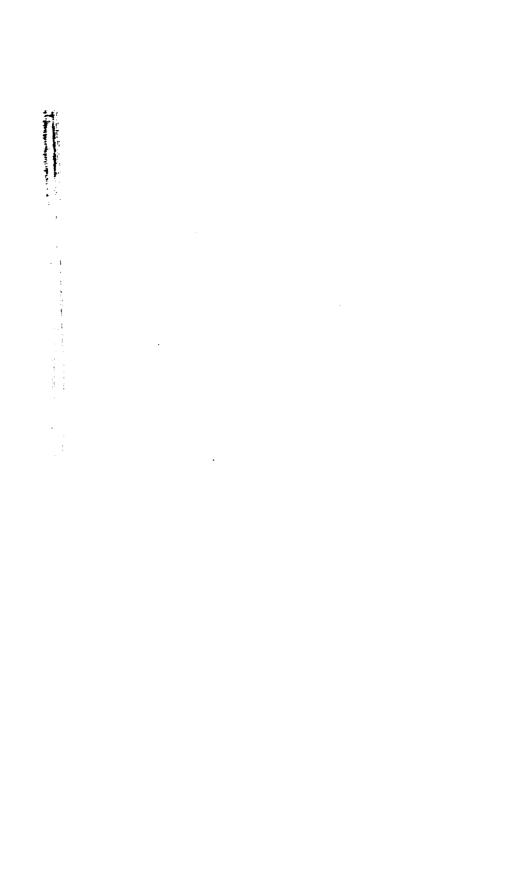


Ova m b) harria hematobia, from usine Drawn from Dr. Harley's preparations  $\pi$  (0),  $\chi$  (0)





thyom of bibbasera hasomatoma, from a specimen of the John Harley's p. 401.  $\times$  215.



#### URINARY CALCULI.

Fig. 1.



Large uric acid calculus, consisting of concentric layers of uric acid, deposited upon a smaller calculus composed of oxalate of lime. p. 407.

Fig. 3.



Mutherry calculus which was of a rich plum colour, p. 411.

Fig. 4.



Small prostatic calculi. p. 410.

Fig. 2.



A beautiful example of oxalate of lime coulds, the surface of which is of a pale brove colour, and the tubercles small and deleas p. 4

Fig. 5.



Large mulberry calculus, two-thirds the ) size. p. 411.

Fig. 6.



Thosphatic calculus. The composition of the central portion is different to that of the body of the nucleus, p. 413.

Fig. 7.



Bleed calculus from one of the infundibula of the kinney. p. 400

Fig. 9.



(hosphatic calculus, The nucleus bein composed of a small uric acid calculus p.4)

Fig. 8.



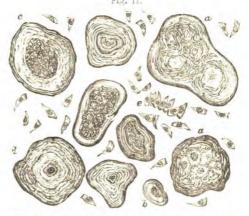
One large and two small black blood calcult found in the pelvis of the kidney. p. 400

VIS DI LII



Small phosphatic calcult from the kidney. The nuclei are composed of a soft granular material, probably consisting of distingated epithelium. p. 413. × 130.

Fig. 11.



Very small calcult, from the follicles of the prestate flund of n man aged a who died of postumona of three weeks' intration. The structure of the blaider and prostate seemed perfectly healthy,  $a_c$  calcult composed of number of smaller ones,  $b_c$  very small calculus containing a single granulation of the financial calculus containing a single granulation had not been deposited;  $d_c$  calculus on which the nucleu seems to be crystalline;  $e_c$  epithellum from the ducts of the prestate,  $p_c$  41,  $g_c$  210.

tone of an inch . . . x 315.



#### URINARY CALCULI.

11





Small compound exalate of lime calculus, found in the urine of a young man who was passing numerous dumbbells of exalate of lime and crystals of or uric acid. Around the surface numerous large dumbbells of exalate of lime are seen partly incorporated with the mass. pp.410,420. ×215.

Fig. 13.



Compound exalgte of lime calculus, from the same case as that shown in Fig. 12. pp. 410, 420. x 130.

Fig. 14.



Uninary deposit, consisting of crystals of triple phosphate and numerous smooth and irregularly shaped microscopic oxidate of line calculu. From a patient suffering from symptoms of renal calculus. Sent by Dr Cotton, p. 420.  $\times$  216.





The same calculi as shown in Fig. 14, after being treated with accide acid, dried and mounted in Canada balsam. The footlet and concentric layers of each individual calculus have been rendered beautifully distinct. p. 420. X 215.



#### URINARY CALCULI.



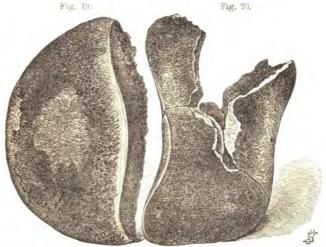
dealus in which spontaneous fracture has occurred in the internal layers only, the separated portion appears to have become again cemented, and encrusted with a subsequent deposit. After Mr. Southam. p. 434.



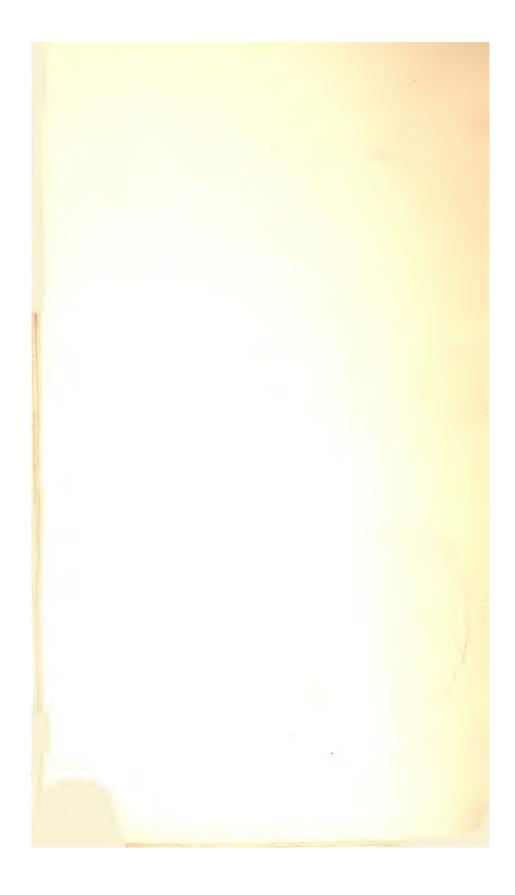
hral portion of a cidenius, removed by Mr. Southam, from a boy, aged 15. p. 434.



Larder fragment of the same stone, which was in the bladder. The separation was not of recent date. p. 434



Large soft wedge shaped stone, having one rounded surface and two facets, removed by lithotomy, by Mr. Luke. Atter Mr. Southam. p. 434. Another stone from the same pahent, with corresponding facets to those upon the stone represented in Fig. 10



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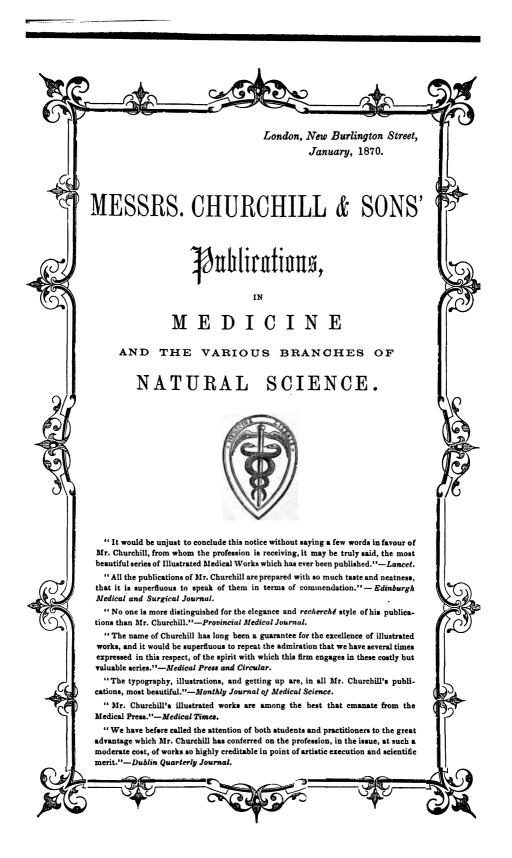
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